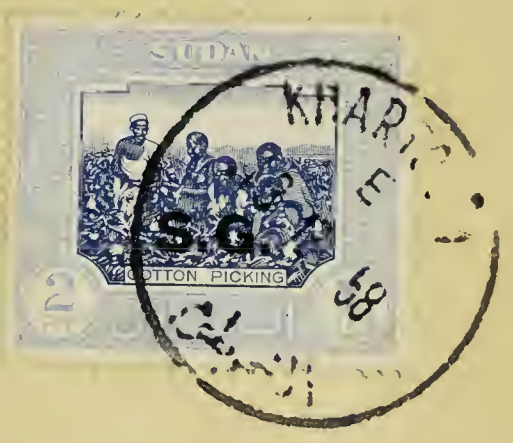
REPORT



OF THE

MEDICAL SERVICES, MINISTRY OF HEALTH

REPUBLIC OF THE SUDAN

FOR THE YEAR

1955/56

(McC. 8816) S.G. 304 M. of H. 400 C. 2/58

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CONTENTS.

CHAPTER I.

INTRODUCTION.

This report covers the period 1.7.55 to 30.6.56. It reviews the work achieved by the Ministry of Health during that period and describes events of international nature connected with this Ministry.

The first event to be recorded was the participation of the Sudan by one member from this Ministry in the Public Health Seminar for the East Mediterranean Region held in Egypt and Sudan. 16 participants from Member Countries and Associate Members attended. The Seminar was led by Professor Stempart of Zagreb University of Yugoslavia and Sir Andrew Davidson of Scotland. While in the Sudan participants were able to study first hand the Organisation of Medical and Public Health Services and the results so far achieved in solving many of the problems of disease in this vast country. The writer is under no false conception to state that all were very much impressed by what they have been told, seen or observed and in the concluding phase of the Seminar the Sudan participant was rather embarrassed by the high praise expressed by practically every member including the Co-Leaders. This was no doubt a credit to the Sudan. Other regional conferences in which the Sudan was represented, were the Malaria Control in West Africa, Rabies conferences in Kenya and the conferences of the African Countries below the Sahara for control of diseases. The Chief Public Health Inspector, Assistant Director (Research) and Assistant Director, Hospitals were the respective representatives. After the declaration of the Independence of the Country which is in itself a very happy episode, the Sudan was accepted by acclamation as full member of the World Health Organisation in May 1956, when the Minister, the Director and Assistant Director of Public Health were the Delegates representing the Sudan. Before this, the Director and Assistant Director represented the country in the Rome 3rd. Health Education Conference attended by over 50 countries.

The two delegates had the opportunity of giving description of how this important subject is now being tackled in the Sudan. It is hoped that the Sudan will become a permanent member of this important organisation dealing with the problem of Education of the Public how to lead a healthy life bodily and mentally.

During the year, expansion and consolidation of medical work both curative and preventative went according to plan. New Hospitals and dispensaries were established and speciality clinics were added to province Headquarter hospitals All this will be mentioned in detail in the body of the report. This year has also witnessed an innovation in Rural Health Service with the introduction of 65 especially designed and equipped ambulances distributed to provinces to serve the villages. They operate according to a time-table with a Medical Assistant whose duty is to visit all villages in his area, enquire into health situation, treat mild cases and evacuate serious ones to dispensary or hospital. Prophylactic vaccination and inoculation could at the same time be done.

Preliminary reports show that this arrangement has filled a big gap and brought treatment home to many citizens who otherwise could not get it because of long distances between them and the nearest Medical unit. Other important use for these Ambulances is the dissemination of Public Health propaganda to villagers in simple hygiene habits and care. Distribution of these Ambulances by provinces will appear later.

The unavoidable delay in opening the Nursing College sponsored by the W.H.O. has at last been overcome by acquiring a temporary building for the purpose until the College buildings are completed. 6 students, graduates of Secondary Schools, have been accepted and the class will start very soon. The natural hesitation of the Sudanese girls to accept this profession has been defeated by much news papers propaganda, radio talks and personal contacts and at last a start was made, now that the ice is broken, it is hoped that no such difficulty will be met in finding more students for the next class.

The W.H.O. Nurses with one Sudanese nurse are carrying the teaching and the new Khartoum Hospital will provide the field for practical training, the students are housed in a Hostel with a Mother Hostess to care for them.

The general Health of the people remained satisfactory save for the continuation in a milder form, of the outbreaks of C.S.M. small-pox and S.S. mentioned in last years report the two first mentioned were brought to end successfully in Upper Nile, Equatoria, Bahr El Ghazal and Kordofan. The appearance of small-pox in Darfur brought in by pilgrims from West Africa was nipped in the bud. As to Sleeping Sickness, the operations have abruptly come to a halt by the disturbances in the South. The Medical work had come to a standstill in most of the District hospitals as a result of desertion of the staff and looting of the equipment. However, this did not last long as the Medical Corps Units accompanying the troops handled the situation and it was through this means, that C.S.M. and small-pox epidemics were controlled and routine medical work re-established.

The formation of the Medical Corps with Doctors recruited from the Ministry of Health began in January, and though it has already taken form, and is responsible in many places for the health of the troops, yet it still remains as a part of this Ministry and the Officer Commanding of the Corps is responsible to the Director and Minister of Health for the health of the Army.

Recruitment of personnel from outside to fill in vacant posts of M.Os. and Nurses proceeded well in accordance with the Ten Years Plan in extending special units to Province H.Q. hospitals.

The Minister and the Director have paid special visits to Western Germany, U.K., and Egypt for this purpose and their contacts have yielded some fruits. Owing to frequent resignations of alien Doctors, the shortage is still felt.

Campaigns against certain endemic diseases were carried on during the year. The Bilharzia, that debilitating disease was attacked through the destruction of carrier snails in the Gezira Irrigated Area. All canals were treated with Copper Sulphate, the lethal Chemical in a systematic way, the scheme cost nearly 200,000 pounds.

Kala-Azar which showed abnormal increase in incidence and invasion of new areas in Fung and Upper Nile Province was dealt with by special campaigns. Treatment and prevention went hand in hand all over the affected area.

Plans were prepared for the resumption of the fight against Sleeping Sickness in the South, a procedure which was interrupted by the mutiny as was mentioned. Plans are also ready for embarkation on a major project of eradication of Malaria in the Fung Province and the actual operation will start very soon.

Result of the B.C.G. Pilot Scheme mentioned in last year's report have revealed the necessity of carrying a mass vaccination against this disease in the three Southern Provinces and the programme is ready in hand for this scheme to operate soon after the rains.

A School Children feeding project was preliminary discussed with UNICEF and an outline of the Scheme was laid. It is hoped to carry this vital project when ways and means are available.

Province Medical Officers of Health Meeting was held in March 1956 under the Chairmanship of the Director. The whole medical policy was reviewed and fully discussed—the deliberations and recommendations of the meeting were raised to the Minister of Health.

Posts Graduate Students :

The following Sudanese Doctors were undergoing Post Graduate studies in U.K. :

3 D.P.H.
4 M.R.C.P.
3 F.R.C.S.
5 D.O.
3 D.G.O.K.
1 Diploma Bact.
1 ,, Path.
1 D.P.M.

The following received their Degrees during the year :—

1 M.R.C.P.
2 D.P.H.
1 D.O.

The Senior Gynaecologist and Obstetrician had 3 months fellowship from W.H.O. in Maternal and Child Health.

CHAPTER II.

ADMINISTRATION.

(a) STAFF AND FUNCTIONS.

Table I, shows the establishment of classified staff. Some categories of professional and technical staff were still under establishment. The table includes officials serving on secondment with Local Governments Authorities.

PERSONNEL.

TABLE I.

Statistics of Classified Staff Establishment
Covering the period 1.7.55 *to* 30.6.56.

CATEGORY	Establishment			
	British	Sudanese	Egyptians	Others
HEADQUARTERS.				
Director		1		
Deputy Direetor		1		
Asst. Direetor Public Health		1		
Asst. Direetor Hospitals		1		
Deputy Asst. Director (P.H.)		1		
Deputy Asst. Director (H)		1		
Senior Establishment Officer		1		
Inspector of Administration		1		
Establishment Officer		1		
Principal Matron		1		
Asst. Prineipal Matron		1		
Chief P.H. Inspector		1		
Principal Sehool of Hygiene		1		
Head Staff Clerk		1		
Staff Clerk		4		
Senior Clerk...		9		
Clerk		20		
Junior Clerk		8		
Statistical Clerk (Trainee)		1		
FINANCE BRANCH.				
Controller of Aceounts		1		
Inspeetor of Aeeounts		1		
Head Aecountant		1		
Aeeountants (including hors cadre post)				
Senior Book-keeper		4		
Book-keeper		19		
Junior Book-keeper		2		
STORES SECTIONS.				
Controller Medical Stores		1		
Asst. Cont. Medical Stores		1		
Supt. of Stores		2		
Stock Verifier		1		
Senior Storekeeper		3		
Storekeeper		18		
Storekeeper (under training Northern Hospital)		10		
Junior Storekeeper		8		
Telephone Operator		1		
TOTAL H.Q.		133		

C.F.

Category	Establishment			
	British	Sudanese	Egyptians	Others
				B.'F.
HOSPITALS AND DISPENSARIES.				
Senior Phyisician and Director		1		
Senior Surgeon		1		
Senior Obstetrician and Gynaecologist ...		1		
Senior Ophthalmologist		1		
Physician	1	7		
Chest Physician		2		
Psychiatrist		1		
Surgeon (Including Ear, Nose and Throat)	2	5	—	2 Ger.
Obstetrician and Gynaecologist	1	5	—	1 ,,
Ophthalmologist	—	5	3	
Radiologist	—	1	—	
Clinical Pathologist	—	—	—	1
General Duty Doctor	4	30	4	4
(Including study course)	1	81	37	1
House Officers	—	26		
Dental Surgeon		1		
Dental Officer		1		
Dental Mechanic	2			
Dental Mechanic (Trainee)		3		
Laboratory Technician				3
Laboratory Technician (U.T.)		5		
Electrical Engineer				1
Pharmacist		1		
Lay Administrator (New L.C.H.) ...		1		
Lay Administrator (Trainee)		1		
Senior Dispenser		5		
Dispenser		16		
Hospital Manager		5		
Dispenser under training		6		
Supt. Radiographer	1			
Radiographer				
Senior Radiographer		2		
Asst. Radiographer (U.T.)		11		
Refractionist		7		
Opthalmic Assist.		7		
Matrons	7			
Asst. Matron	13			
Physiotherapist	6			
Senior Nursing Sister	2	9		6
Nursing Sister	3	31	2	4
Nurses (U.T.) (Abroad)		2		
Theatre Attendant		54		
Senior Nursing Instructor		2		
Head Mumarid		48		
Theatre Sister	1			
Sister Tutor	2			
Dietician Sister	1			
Senior Medical Assistant		15		
Medical Assistant		474		
Senior Bookkeeper		14		
Bookkeeper (h.c. Posts)		21		
Junior Bookkeeper		30		
Senior Clerk...		8		
Clerk		25		

Category	Establishment			
	British	Sudanese	Egyptians	Others
B./F.				
Junior Clerk		12		
Senior Storekeeper		1		
Store-keeper (Including H.C. Posts for New Khartoum C.N.)		16		
Junior Storekeeper (Ex-Clerk)		41		
Storekeeper U.T. (South Hospital) ...		10		
Telephone Operator		6		
Quarantine Overseer		2		
Southern Trainees		10		
Total Hospitals snd Department ...	43	1068	44	30
PUBLIC HEALTH.				
Province Medical Officer of Health ...		11		
Asst. Prov. Med. Officer of Heath ...		8		
Women Doctor	1			
Port Health Officer				1
Principal, M.T. School	1			
Asst. Principal, M.T. School	1			
Supt. Nurse Officer	2	10		
Supt. M.T. School		6		
Principal H.V.T. School		1		
Asst. Prin. H.V.T. School		1		
Senior Health Visitor		6		
Senior Staff Midwives		6		
Staff Midwife		15		
Health Visitors	2	9		
Senior Public Health Inspector		11		
Public Health Inspector		12		
Public Health Officer		43		
P.H. Student U.T....		4		
Senior Sanitary Overseer		1		
Sanitary Overseer		172		
Senior Technical Clerk		1		
Clerk		5		
Junior Clerk		12		
Junior Bookkeeper		1		
TOTAL (P. HEALTH)	7	336		1

Unclassified Staff numbered 6,866 approximately.

PHYSICIANS ETC. PRACTISING IN THE SUDAN.

Appointment	Govt. Officials Serving with Ministry of Health	Private Practice
	No.	No.
Specialists	18	
Physicians	12	
Surgeons	11	67
General Duty Doctors	135	
Dentists	4	28
Pharmacists	2	30
Dispensers	21	
Medical Assistants	501	

(b) **LEGISLATION.**

The following legislation affecting public health were enacted during the year :—

ACTS.

Date	Title	Provision
15.3.1956 ...	The Miscellaneous Amendments Act, 1956.	(1) In clause (a) of Section 28 of the Pharmacy and Poisons Ordinance, 1939 the following amendment has been added :— Provided that if the dangerous drug prescribed is Pethidine or Morphine no supply shall be repeated without a fresh prescription, and the maximum quantity to be supplied in consequence of one prescription shall not exceed, 3 ampoules of 100 mgms each or 6 ampoules of 50 mgms each or 12 tablets of 50 mgms each ; and in the case of morphine, 3 ampoules of $\frac{1}{3}$ grains each or 4 ampoules of $\frac{1}{4}$ grains each or 6 ampoules of $\frac{1}{6}$ grains each and the supply of aforementioned two drugs shall not be repeated within any single period of seven days without the approval in writing of the Province Medical Officer of Health. (2) In clause (b) of Section 30 the following Sub-Clause is added, namely:—(V) Pethidine and its derivatives and substances containing any one or more of them.

(c) **FINANCE.**

Table II. (A).

Income and Expenditure of Ministry of Health over the last 4 years.

Item	1952/53 £E.	1953/54 £E.	1954/55 £E.	1955/56 £E.
Revenue :	50,260	48,063	50,047	44,808
Expenditure :				
Personnel and Personal Allowances ...	1,317,580	1,438,574	1,537,750	1,464,612
Services	978,379	1,186,427	1,359,724	1,169,724
Extraordinary	26,182	34,421	26,095	28,000
Total	2,322,141	2,659,422	2,923,569	2,662,204

Table II. "B"

Analysis of the Expenditure of the Ministry of Health in 1955/56 from 1.7.1955 to 30.6.1956.

Sections	Personnel	Services	Extra-ordinary	Total
	£E.	£E.	£E.	£E.
(a) Headquarter	89,820	271,260	—	361,080
(b) Hospital	1,121,760	841,331	—	1,199,092
(c) Hygiene and P.H.	206,772	50,940	—	257,712
(d) Research	45,120	6,060	—	51,180
(e) Graphic Museum	1,140	—	—	1,140
(f) Seconded Staff	—	—	—	—
Total	1,464,612	1,169,592	—	2,662,204

Remarks :—

1955/56 (1) Figures are based on actual expenditure up to 31.1.1956 plus,

(2) Estimated Expenditure for period 1.2.1956 to 30.6.1956

CHAPTER III.

PUBLIC HEALTH.

(a) HEALTH OF OFFICIALS.

Table III.

Nationality		Number of officials employed	Number Placed on sick list	No. of days Sick	Average days sickness: For all officials	Average days sickness: For those reported sick	Died	Invalided
British	1954/55	732	102	1,012	1.04	9.92	—	3
	1955/56	259	28	234	0.90	8.36	1	15
Sudanese	1954/55	9,007	2,585	22,805	2.53	8.82	3	1
	1955/56	11,521	2,304	17,854	1.54	7.74	4	4
Others	1954/55	176	55	432	2.45	7.85	0	—
	1955/56	347	32	146	0.42	4.56	—	1

(b) GENERAL HEALTH.

Expansion and consolidation continued during the year. Clinics established were as follows :—

2 Dental Clinics at :—

Wad Medani, and El Obeid.
One Eye clinic was opened in Atbara.

2 X-Ray Departments were also established at :—
Abu Usher and El Fasher.

Extra bed accommodation and special T.B. wards were added to Wad Medani Hospital.

TABLE IV.

Work done in Hospitals and Dispensaries.

YEAR	Admissions	Attendances	Operations
1946	126,586	8,474,874	15,509
1947	142,294	9,253,251	16,785
1948	140,511	9,280,304	17,573
1949	151,011	10,186,668	21,327
1950/51 (18 Months)	302,526	16,503,371	31,459
1951/52	168,251	12,181,931	26,021
1952/53	164,331	13,966,390	26,114
1953/54	172,675	14,483,366	34,432
1954/55	171,092	16,453,892	38,285
1955/56	154,903	17,694,550	38,287

There were 67 licenesd private practitioners working independently during the year under review whose statistics are not included above.

(c) VITAL STATISTICS.

The official census which was started towards the second half of 1954 55 is still going on and so no accurate figures could be quoted. So far it appears that the actual estimated population would be higher than what was hitherto estimated.

TABLE V.

Approximate Estimation of population by Provinces.

PROVINCE	Men	Women	Children	Totals
Bahr El Ghazal	277,370	343,926	461,542	1,082,838
Blue Nile	545,448	658,131	899,645	2,103,224
Darfur	342,854	460,118	763,739	1,566,711
Equatoria	185,915	435,919	309,370	931,204
Kassala	160,929	176,131	146,800	583,860
Port Sudan	101,170	82,838	111,198	295,206
Khartoum	171,490	165,156	258,279	594,925
Kordofan	1,269,792	687,263	1,123,829	3,080,884
Northern	209,805	282,035	364,681	856,521
Upper Nile	187,538	242,072	372,416	802,026
TOTALS	3,452,311	3,533,589	3,911,499	11,897,399

Table VI.

Estimated Population of Towns of Khartoum, Khartoum North, Omdurman.

Town	Men	Women	Children	Totals
Khartoum	36,909	29,745	32,034	98,697
Khartoum North	18,178	17,324	27,314	62,816
Omdurman	38,452	48,815	55,538	142,805

Table VII.

Crude Birth Rate, Khartoum, Khartoum North, Omdurman.

Town	No. of registered Births	Crude Birth Rate
Khartoum	3,066	31.0
Khartoum North	1,463	23.2
Omdurman	4,330	30.3

These figures are calculated from births attended by Trained Midwives who usually register these cases, but, by no means, must these be taken as accurate representation of the real picture. Registration of births and deaths are nowhere complete.

(d) PREVENTIVE MEDICINE.

1. Insect-borne Diseases.

Malaria still tops the list of the major endemic diseases in this country in spite of the yearly expanded efforts of combating it through systematic spraying with Gammexane in all Provinces. It is not claimed that the whole country is covered by this spraying and the main set back lies in the communication difficulties once the rains set in.

MALARIA INCIDENCE 1955/56

Year	Bahr El Ghazal			Blue Nile			Darfur			Equatoria			Kassala			Khartoum			Kordofan			Northern			Upper Nile		
	Cases	D	Mean Rain fall m.m.	Cases φ	D φ	Mean Rain fall m.m.	Cases	D	Mean Rain fall m.m.	Cases	D	Mean Rain fall m.m.	Cases	D	Mean Rain fall m.m.	Cases	D	Mean Rain fall m.m.	Cases	D	Mean Rain fall m.m.	Cases	D	Mean Rain fall m.m.	Cases	D	Mean Rain fall m.m.
1951/52	7,442	17	877	85,727	70	358	17,987	18	567	26,052	87	1,264	22,169	32	284	13,679	8	112	41,612	26	517	18,884	10	24	11,497	21	850
1952/53	6,116	20	1,063	89,074	58	401	29,210	8	564	32,717	129	1,140	28,891	27	335	16,326	7	163	79,907	55	626	22,065	3	94	14,252	11	913
1953/54	5,873	21	869	83,720	53	487	24,025	20	541	54,567	103	1,220	41,846	26	341	15,116	3	200	76,685	43	565	16,706	2	93	17,692	23	891
1954/55	12,952	33	1,023	105.589	38	481	45,927	18	614	56,617	135	1,115	44,586	29	156	16,001	10	247	113,105	61	604	16,017	—	50	28,492	13	898
1955/56	10,945	19	1,013	85,771	59	407	26,607	24	510	37,203	93	1,320	33,933	23	257	15,313	2	174	100,504	36	456	13,651	4	15	28,667	18	865

φ Figures include Gezira Irrigated Area.
Separate figures for the Gezira Irrigated Area, which is more controlled and wholly covered by spraying teams, show a great improvement in incidence.

Year	No. of Cases Diagnosed as Malaria	Recorded Rainfall
1950/51	20,684	327.3 m.m.
1951/52	4,336	255.6 m.m.
1952/53	4,351	414.4 m.m.
1954/55	4,781	393 m.m.
1955/56	1,614	271.6 m.m.

The number of rooms sprayed in Gezira Irrigated Area was 273,981
The number of rooms sprayed in Managil adjacent area as an additional measure was 26,377

Table VIII.

Species of Parasite in 8,032 Positive Slides :—

Province	*P. Falciparum*	*P. Vivaz*	*P. Malaria*
Bahr El Ghazal	541	—	—
Blue Nile	1,079	169	—
Darfur	324	79	—
Equatoria	2,339	103	32
Kassala	451	97	2
Khartoum	123	26	1
Kordofan	2,077	146	4
Northern	144	20	1
Upper Nile	200	12	17

(ii) *Blackwater fever.* Number of cases recorded was 10 as compared to 8 last year.

Table IX.

(iii) *Relapsing Fever.* Cases and Deaths over 10 Years.

Year	Cases	Deaths
1946	1,952	65
1947	568	67
1948	287	8
1949	376	3
1950/51	36	2
1951/52	12	0
1952/53	97	14
1953/54	91	8
1954/55	3	1
1955/56	1	—

(IV) *Leishmaniasis.*

This disease is causing more concern and so special mobile teams preventive and curative are probing the whole infected and suspected areas.

The Campaign was organised in Fung Area under the Province Medical Officer of Health and Medical Inspector Sennar and a preliminary Survey in Upper Nile was done by one member of the Research Laboratory.

Table X.

Leishmaniasis : Recorded incidence in 10 years.

Year	No. of Cases	
1946	246	
1947	327	
1948	460	
1949	523	
1950/51	638	(18 months period)
1951/52	1,063	
1952/53	613	
1953/54	895	
1954/55	1,106	
1955/56	1,889	

Table XI.

Leishmaniasis, 1955/56 *Distribution by Provinces.*

Province	Cases	Deaths
Bahr El Ghazal	—	—
Blue Nile	1,284	43
Darfur	15	1
Equatoria	60	1
Kassala	381	53
Khartoum	14	1
Kordofan	3	—
Upper Nile	131	9
Total	1,889	108

(v) *Trypansomiasis.*

The campaign organised with W.H.O. Assistance was unfortunately interrupted by the unfortunate disturbances and the work was abandoned by the teams-Also inspection was made impossible by the dispersion of the people.

Table XII.

Trypansomiasis : Distribution of Cases in Equatoria in 10 *years.*

Year	Yubu	Yambio	Yei	Kajo-Kaji	Meridi	Imported	Other Localities
1946 ...	21	19	16	—	—	—	—
1947 ...	18	6	21	—	2	—	—
1948 ...	32	23	20	—	—	—	—
1949 ...	5	12	17	—	—	—	—
1950/51	15	33	12	—	—	—	—
1951/52	—	93	3	—	26	—	—
1952/53	—	53	13	—	—	2	—
1953/54	12	148	44	—	—	—	—
1954/55	—	467	92	—	1	1	—
1955/56	2	210	98	—	—	—	—

(VI) *Filariasis.*

767 cases were microscopically diagnosed during the year.

736 cases of this total came from Bahr El Ghazal and Equatoria Provinces of the South.

2. EPIDEMIC AND ENDEMIC DISEASES.

(i) *Anthrax* : 92 cases with 1 death were reported.

(ii) *Cerebro-spinal Meningitis* :

Again this year the disease appeared in all provinces of the Sudan occuring in most places sporadically but has reached epidemic proportions in the two same provinces as last year i.e. Bahr El Ghazal and Upper Nile. This is the 4th. year that the disease has been going on fairly large incidence in Bahr El Ghazal.

Table XIII.

Cerebro-spinal meningitis : Recorded incidence and fatality 1955/56.

Province	Cases	Deaths	Fatality Rate
Blue Nile	122	22	18.0
Darfur	50	8	16.0
Kassala	254	17	6.7
Khartoum	49	8	16.3
Kordofan	147	37	25.2
Northern	20	7	35.2
Total Northern Provinces ...	642	99	15.4
Bahr el Ghazal	6,710	567	8.4
Equatoria	159	18	11.4
Upper Nile	1,517	144	9.5
Total Southern Provinces ...	8,386	729	8.6
Overall Total	9,028	828	9.2

Table XIV

Cerebro-spinal Meningitis : Recorded incidence and fatality over 10 *years.*

Year	Recorded Cases	Recorded Deaths	Fatality Rate
1946	730	155	21.2
1947	443	159	35.9
1948	170	59	34.7
1949	353	102	28.9
1950/51 (18 Months)	57,575	7,710	13.4
1951/52	14,527	2,031	14.0
1952/53	2,938	644	21.9
1953/54	8,942	827	9.2
1954/55	3,470	492	14.2
1955 56	9,028	828	9.2

Table XV.

(iii) *Diphtheria : Recorded incidence and Fatality* 1955/56.

Province	Cases	Recorded Deaths	Fatality Rate
Bahr El Ghazal	1	1	100.0
Blue Nile	67	8	11.9
Darfur	3	1	33.3
Equatoria	2	1	50.0
Kassala	94	11	11.6
Khartoum	91	3	3.3
Kordofan	52	5	9.6
Northern	38	6	15.7
Upper Nile	8	2	25.0
Total	356	38	10.7

Table XVI.

Diphtheria : Recorded incidence and deaths in 10 *years.*

Year	Cases	Deaths
1946	390	61
1947	319	37
1948	326	27
1949	264	36
1950/51 (18 months)	573	77
1951/52	280	30
1952/53	717	37
1953/54	335	27
1954/55	369	61
1955/56	356	38

(iv) *Dysentry.* 3,798 cases were treated in Hospitals and 80,470 as outpatient cases.

(v) *Enteric Fever.* Admissions to hospital showed some decrease this year but the main foci of infection remained the same with the Blue Nile Province heading the list then Northern Province, Kassala, and Khartoum.

Table XVII

Enteric Fever : Distribution 1955/56.

Province	Cases	Deaths
Bahr El Ghazal	—	—
Blue Nile	196	11
Darfur	3	—
Equatoria	5	1
Kassala	45	1
Khartoum	52	1
Kordofan	16	—
Northern	115	6
Upper Nile	17	3
Total	449	23

Table XVIII.

Enteric Fever : Incidence over 10 years.

Year	Recorded Cases
1946	116
1947	144
1948	202
1949	311
1950/51 (18 months)	560
1951/52	578
1952/53	598
1953/54	560
1954/55	548
1955/56	449

(vi) *Gastro-enteritis of Children.* Records of Hospitals and Dispensaries, registered 74,730 cases of which 2,131 required hospitalization with 234 deaths. A fatality rate of just over 10 per cent.

(vii) *Leprosy.* The total number of inmates in settlements in the country was 1655.

During the year 1,248 were diagnosed of which 463 came from Equatoria the known heavily endemic zone.

The policy of making supplies of Sulphone available in all dispensaries to encourage domociliary treatment was continued and special treatment cards were to be kept for out-patient cases.

(viii) *Poliomyelitis.* 176 cases were recorded this year. This is a higher figure compared to previous records—of these 172 were diagnosed in Khartoum. Only 5 of the recorded cases received hospital treatment.

(ix) *Rabies.* 19 human cases were recorded during this year.

(x) *Small-Pox.* The outbreaks of this disease mentioned in my last Annual Report continued in the three Southern provinces i.e. Equatoria, Bahr El Ghazal and Upper Nile Provinces and the disturbances which took place much delayed the counter measures and also facilitated its spread to Kordofan Province where it was introduced by migrating labour.

Total number of cases reported was 1427 with 284 deaths.

However, counter measures were intensified and it was possible to control and at last stamp it out.

Total number of small-pox vaccination done were :

Bahr El Ghazal	94,150
Blue Nile	29,182
Darfur	88,868
Equatoria	290,725
Kassala	198,351
Khartoum	157,492
Kordofan	862,422
Northern	2,606
Upper Nile	24,394
Total	1,748,190

(xi) *Tuberculosis* : Admissions to hospital in 10 years.

Year	Pulmonary	Non-Pulmonary	Total
1946	888	613	1,501
1947	877	599	1,476
1948	1,019	604	1,623
1949	1,176	650	1,826
1950/51 (18 months)	1,611	883	2,494
1951/52	1,325	747	2,072
1952/53	1,679	671	2,072
1953/54	2,075	798	2,873
1954/55	2,868	915	3,783
1955/56	2,697	823	3,520

Table XIX.

Tuberculosis 1955/56 *Hospital Admissions by Provisions.*

Province	Pulmonary	Non-Pulmonary	Total
Bahr El Ghazal	177	29	206
Blue Nile	678	138	816
Darfur	113	81	124
Equatoria	129	28	157
Kassala	562	164	726
Khartoum	404	113	517
Kordofan	267	89	356
Northern	263	95	358
Upper Nile	104	86	190
Total	2,697	823	3,520

Table XX.

Tuberculosis, 1955/56 *Distribution of all cases diagnosed.*

Province	Pulmonary	Non-Pulmonary	Total
Bahr El Ghazal	223	29	252
Blue Nile	1,304	473	1,777
Darfur	186	106	292
Equatoria	150	39	189
Kassala	669	448	1,117
Khartoum	759	370	1,129
Kordofan	369	172	541
Northern	527	215	742
Upper Nile	260	169	429
Total Northern Provinces	4,447	2,021	6,468

3. HELMINTHIC DISEASES.

(i) *Ankylostomiasis* : 6,068 of 6,877 cases reported were in the two southern provinces i.e. Bahr El Ghazal and Equatoria.

(ii) *Drancontiasis* : 17,142 cases were treated.

(iii) *Bilharzia* : The proposed project for snail eradication referred to in my last annual report was executed during the year. Medical Officer of Health G.I.A. writes " Bilharzia, being the disease that has, since the inception of the scheme, been responsible for ill health in the area, was fought seriously this year. The battle had greatly changed the long standing history of the disease in this particular area and in the world as a whole. The campaign against the snails was started in November 1955 and ended late in May 1956, when all the system together with the reservoir at Sennar were adequately treated. Control against re-infestation was also carefully planned. Examination and treatment are also being conducted on a bigger scale by all the dispensaries and the special Bilharzia teams.

Although it is too early to draw a conclusion as to the effectiveness of the campaign, yet a marked decline in the figures of the dispensaries was observed and the people themselves seemed to have appreciated this preventive revolution. Still much attention has to be focused to guard against re-infestation and so the checking teams are active all along the system while the control barriers are fed continuously.

To have a statistical data for future reference, random sampling of the whole area was done before the campaign. After analysing the figures a sample of these villages was treated before the campaign and the rest were put under treatment soon after eradication. It may take a year or more to treat the whole lot. The idea is to re-examine these same villages after an elapse of a few months after treatment. A conclusion can then be drawn whether the campaign was effective or not."

Figures for the Gezira as recorded by the dispensaries and Abu Usher Hospital were as follows :—

Unit	Total Examined	Total B Mansoni	Total B. Hm.
Gezira Dispensaries	101,087	4,611	3,113
Abu Usher Hospital ...	9,022	350	78
	110,109	4,961	3,191

Both types were seen. Obviously hundreds of cases were treated by Wad Medani hospital and private practitioners.

A good supply of Antimony Tartarate and Fouadine was issued to the dispensaries for treatment. It is hoped to examine and treat as much as practicable next year.

THE SNAIL ERADICATION CAMPAIGN.

After the significance of the research on the pilot scheme was confirmed by international authorities, it was finally decided to extend the same method to the whole area.

1. Preparation for the initial sulphation of the whole system of canals together with the reservoir at Sennar were started in July 1955. By October all the necessary materials together with 800 tons of copper sulphate were in hand. In addition to the skilled staff of the Bilharzia Section, labourers were recruited and put under training. The operation started on November the 14th the day of the evacution of the foreign troops from the Sudan. Is that not a coincidence ?

2. The whole Gezira canalization system was divided into 9 divisions in accordance with the Ministry of Irrigation sub-divisions and then a detailed programme was worked out to do each division in a specific period. The work was on the yardstick system. The campaign started from the Southern part of the Gezira and ended in the North West. The number of the casual labourers fluctuated between 600 and 1000. Sufficient mechanised transport was hired from the Ministry of Mechanical Transport and few suk lorries were hired for a very short period before the M.T.D. cars arrived in full.

3. The fully appreciated co-operation of the field personnel of the Ministry of Irrigation as well as those of the Sudan Gezira Board added a lot to the easy going of the campaign. Canals of each division had to be closed for 24 hours while sulphation was going on in that area while all their tools and machines were put under our disposal.

4. Proper weeding had to be done first and the open sulphation had to follow the day after. The weeding of the then badly choked canals took most of our time and money when all means were operating mechanical launches, camel drawn chains, man drawn chains and sword cutting. In this particular respect we saved a lot of money and labour for the Ministry of Irrigation.

The amount of copper sulphate required to sulphate each canal had to be calculated according to its full capacity of water making an average of 100 kilogram per 1 kilometre of length. This amount of the drug used to be divided into small sacks of 4 k. grm. capacity and then distributed evenly along both banks of the canal. Sulphation always started from the tail towards the intake. The chemical barrier had to be fixed across the intake of the major before sulphation started in the system.

5. Eradication from all the majors and minors had finished on March the 6th while the sulphation of main canals and the reservoir at Sennar was deferred till the closure, of canals during which period all the then existing eggs would have hatched completely and the swift current had to come to a stand-still. Work was then resumed on May the 15th to treat both and 100 labourers were employed to do the work. They were both adequately sulphated on the 26th.

6. Mechanical Trapping : An experiment with mechanical trapping was conducted on Tabat Branch last year when it was observed that snails could be decreased by nearly 75 per cent. It was a simple trap made of rails and net wires and hung from a bridge all along the width of the canal. Its lower edges goes deep into the water for about 50 cms. As a result of that all the floating weeds

on which snails were trapped were collected manually to either bank for destruction by fire. This same design of trap was adopted on the main canal at Kilo 50. It was again observed that a good amount of snails were trapped and destroyed. This is now considered as a successful weapon to decrease the pressure put on the chemical barrier.

GEZIRA IRRIGATED AREA
BILHARZIA.

Year	HAEMATOBIUM						MANSONI					
	Children			Adults			Children			Adults		
	Exam. No.	No. Inf.	%	Exam. No.	No. Inf.	%	Exam. No.	No. Inf.	%	Exam. No.	No. Inf.	%
1955/56	15,153	665	4.4	28,697	819	2.8	15,153	1,255	8.3	28,697	1,942	6.7

Distribution of Bilharzia cases recorded in the whole Country was as follows :—

	Cases	Deaths
Bahr El Ghazal	386	1
Blue Nile Province	13,346	6
Darfur Province	3,700	1
Equatoria	1,878	3
Kassala	276	—
Khartoum	1,408	1
Kordofan	6,778	1
Northern	3,770	1
Upper Nile	125	1
	31,741	15

(e) SANITARY CIRCUMSTANCES.

Water Supplies.

Efforts to improve water supply continued all over the country. More deep wells were sunk in Gezira Irrigated Area. Protected Haffirs continue to be established and Dams built.

Meridi water supply was greatly improved and piped water is now available to all. In Shendi, Berber, Rufaa, Dueim and Singa towns pure water supply works are progressing satisfactorily while in El Obeid it was possible to supply more houses with pure piped water.

Refuse Disposal. No substantial change in the methods of refuse disposal took place. The system continued to be of collection burning or dumping. Motor transport for the purpose is replacing animal transport in many towns and daily collection of the refuse is the rule.

Sewage Disposal. The work on the scheme of water carriage system for Khartoum City continues.

While the double bucket systems is the main system of disposal in all towns, septic tanks and Aqua privy latrines are gaining more popularity especially in big towns like Khartoum, Omdurman, Khartoum North and Kassala.

Pit latrines are used in village and towns where soil is suitable.

Housing and Town Planning. Re-planning of towns continues. More open spaces to serve as public parks are common features of the planned towns.

Plans of houses are subjected to P.H. Control before the building is authorised.

Food in Relation to Health. No shortage of food items was reported from any part of Sudan.

Regular meat and vegetable shops and restaurant inspection was continued. Milk supply was subjected to stricter control both by P.H. and Veterinary Authorities after some incidents of poisoning as a result of infected udders.

Poisoning by wine containing arsenic was detected and all quantities destroyed.

Industrial Hygiene. Routine inspection of premises and means of disposal of waste products was kept going. No adverse conditions to the health of workers was detected.

CHAPTER IV.

SOCIAL HYGIENE.

Midwifery. Table XXI shows the midwifery training schools working at the end of the year, date of foundation of each school, total number of midwives trained in the school since opening and the number trained in 1955 56.

TABLE XXI.

SCHOOL	Date of Opening	Total Midwives Trained Since Opening	Total Trained in 1955/56
Omdurman	1920	757	21
El Obeid	1948	34	12
Juba	1950	12	—
Malakal	1952	13	7
Wad Medani	1953	20	12
Atbara	1955	10	10
		846	62

TABLE XXII.

Distribution of licensed midwives trained in the Sudan 1955 56 :

PROVINCE	District Midwives	Certificated Nurses	Uncertificated Nurse Midwives	Health Visitors	Total
Bahr El Ghazal	—	3	2	—	5
Blue Nile	130	6	5	7	148
Darfur	31	3	—	1	35
Equatoria	1	—	10	1	12
Kassala North	14	10	—	2	26
Kassala South	22	1	2	1	26
Khartoum	121	38	3	9	171
Kordofan	67	10	4	3	84
Northern	115	6	3	2	126
Upper Nile	15	—	2	1	18
	516	77	31	27	651

MATERNAL AND CHILD HEALTH.

Improvement and expansion of services in this field has continued. More trained midwives for Districts and Hospitals were posted to various parts of the country. Ante-Natal clinics are conducted by trained midwives while child health centres are under the charge of Health Visitors. In both cases qualified medical supervision is available.

Sudanese Health Visitors were working in the following stations :—

Khartoum	3
Omdurman	3
Khartoum North	1
Wad Medani	2
Kosti	1
El Fasher	1
Port Sudan	2
El Obeid	1
Atbara	2
Dueim	1
Singa	1
Kassala	1
Malakal	1
	20

The actual number of Ante-Natal centres which were operating during the year was as follows :—

Location	Ante-Natal Centre	Child Welfare Centre
Wau	1	—
Kwajok (Mission)	1	—
Wad Medani	2	2
Hassaheisa	1	—
Ed Dueim	1	1
Kosti	1	1
Sennar	1	—
Singa	1	1
Roseires	1	—
El Fasher	1	1
Nyala	1	—
Geneina	1	—
Juba	1	—
Lui (Mission)	1	—
Amadi	1	—
Meridi (Mission)	1	—
Torit	1	—
Kassala	1	1
Gedaref	1	—
Port Sudan	2	2
Khartoum	3	3
Khartoum North	1	1
Omdurman	3	3
Khartoum (Rural)	3	—
El Obeid	1	1
Nahud	1	—
Talodi	1	—
Kadugli	1	—
Um Ruaba	1	—
Abu Zabad	1	—
Moglad	1	—
Abri (Mission)	1	—
Heiban (Mission)	1	—
Atbara	2	2
Wadi Halfa	1	—
Merowe	1	—
Debeira	1	—
Malakal	1	1
Fangak	1	—
Tonga	1	—

The figures below, though not complete for all provinces, show the activities of these centres during the year :

Province	Attendance at Ante-Natal Clinic	Home Visits	Attendance at Child H. Centre	Delivery By Trained Midwives
Darfur	93	547	1,592	—
Port Sudan ...	8,567	—	4,350	1,360
Kassala Area ...	7,593	—	—	—
Northern Province	11,740	—	9,314	—
Kordofan	3,894	—	1,633	—
Blue Nile ...	8,650	1,044	4,969	—
Khartoum ...	41,981	6,308	28,836	—

MEDICAL EXAMINATION OF SCHOOL CHILDREN.

School Medical Service. The number of pupils medically examined was :—

Bahr El Ghazal	124
Blue Nile	26,714
Darfur	4,812
Equatoria (Schools closed down)	—
Kassala	17,524
Khartoum	12,398
Kordofan	10,934
Northern	24,871
Upper Nile	1,625
Total	99,002

Details of Diseases discovered.

Name of School	No. Examined	Trachoma	Bilharzia	Spleen	Pulm T.B.	Ankylostoma	Dental caries	All Other Disease
Bahr el Ghazal	124	—	9	30	—	4	—	—
Darfur Province	4,812	1,102	316	701	—	—	—	69
Port Sudan ...	6,935	876	3	86	4	—	—	—
Kassala P. ...	10,589	1,043	32	575	—	—	—	—
Northern P. ...	24,871	6,220	923	436	—	51	1,856	—
Kordofan P. ...	10,934	888	1,439	2,234	3	1	—	30
Blue Nile P. ...	13,037	1,134	123	859	—	2	—	3
Khartoum P. ...	12,398	3,091	16	159	—	—	—	—
Gezira Irrigated Area ...	13,677	2,614	1,182	1,092	—	4	—	—
Upper Nile ...	1,625	115	17	41	2	11	—	—
	99,002	17,083	4,060	6,213	9	73	1,856	102
Percentage ...		17.15	4.1	6.27	—	—	—	—

Mental Health. The Mental Diseases Board examined 22 cases classified as follows :—

Schizophrenia	5
Neurosis	4
Epilepsy	2
Chronic Alcoholism	1
Depression	1
Aortic Sclevosis and Delerictions	1
Re-Examination	2
Improved	1
Recovered	5
	22

Figures and Categories. The total number of cases seen during the year amounted to 5,008 of which 602 were new cases and the balance of 4,406 represented the return attendance. 3,648 males as opposed to 1360 females were registered including 420 children mostly epileptics and mentally defectives.

Nothing novel in the diagnostic range was recorded and the relative incidence of the various reaction-types did not contradict the impressions portrayed in previous reports.

The Kobar Institution is still run by a Penal Officer from the Department of Prisons. He is intelligent, co-operative and eager to adopt psychiatric principles in lieu of penal and custodial measures. Consequently a great deal of improvement has been effected in the social and rehabilitational services.

The number of inmates in confinement is 125 (115 males and 10 females). 25 cases were admitted during the year against 12 cases which were transferred for custody in Province prisons.

No cases were discharged.

Health Education. The main media for Health Education remains to be weekly Radio talks, Mobile exhibition in tribal gathering, lectures in graphic museums to school boys and other categories of official and through the District Midwife in villages.

CHAPTER V.

PORT HEALTH : QUARANTINE.

No seaport or airport was declared infected.

Disinfection of aircraft and quarantine control of air travellers was undertaken at Wadi Halfa, Port Sudan, Khartoum, Juba, Malakal, Geneina, El Fasher, El Obeied and Kassala airports.

The Aedic index was calculated on an inspection of all habitations within the area concerned. Table XXIV shows the Aedic index throughout the year at certain airports on international routes.

TABLE XXIII.

Aedes Aegypti Index.

MONTH	El Fasher	Juba	Kassala	Port Sudan	Khtm.	El Obeid	Wadi Halfa	Malakal
July	—	—	0.1	—	—	—	—	—
August	—	—	—	—	—	—	—	—
September ...	—	—	—	—	—	—	—	—
October ...	—	—	—	—	—	—	—	—
November ...	—	—	—	—	—	—	—	—
December ...	—	—	—	—	—	—	—	—
January ...	—	—	—	—	—	—	—	—
February ...	—	—	—	—	—	—	—	—
March	—	—	—	0.09	—	—	—	—
April	—	—	—	0.05	—	—	—	—
May	—	—	—	—	—	—	—	—
June	—	—	—	—	—	—	—	—

Port Sudan Quarantine. 1,159 ships entered Port Sudan harbour. The number of sambuks entering Flamingo Bay was 1,142. Radio pratique was granted to 884 ships. No case was isolated in the quarantine station.

Suakin Quarantine. The number of pilgrims who have left Suakin for Jeddah in the past 10 years has been :

1946/47	8,404
1947/48	12,020
1948/49	11,105
1949/50	5,091
1950/51	4,666
1951/52	6,491
1952/53	15,051
1953/54	13,950
1954/55	13,921
1956	11,427

2,660 pilgrims left Port Sudan for the Hedjaz by air in 1956.

All outgoing pilgrims were immunised against cholera, small-pox, yellow fever and typhoid.

The pilgrimage was declared clean. Returning pilgrims were detained in quarantine only for medical formalities to be undertaken.

Wadi Halfa Quarantine. Routine examination for schistosomiasis of persons entering the Sudan from the north was stopped. Delousing with D.D.T. powder was imposed on third class passengers on reports of typhus fever in Egypt. 541 river vessels were inspected.

Geneina Quarantine. 29,427 persons passed through the post. Delousing with D.D.T. power was imposed. 8,452 persons were vaccinated against small-pox and 6,823 inoculated against cholera.

Medical Mission to the Hedjaz. The mission consisted of two doctors and 16 other staff. Treatment centres were established at Jeddah, Mecca, Muna and Medina. Medical care was afforded to many nationalities, including pilgrims and local population. 9,059 out-patient cases were treated. 58 persons were given inpatient treatment.

CHAPTER VI.

HOSPITALS AND DISPENSARIES.

TABLE XXIV.

Number of Hospitals and beds available.

PROVINCE	HOSPITALS 49	Beds in Hospitals		Number of dispensaries and Dressing Stations	Beds in Dispensaries	Total Beds	Beds per 1,000 Population.
		Gen.	T.B.				
B. El Ghazal	Wau	253	35	48	186	643	0.59
	Rumbek ...	129	—				
	Aweil ...	40	—				
Blue Nile ...	Wad Medani ...	381	120	179	65	1,470	0.70
	Abu Usher ...	186	—				
	Kosti	152	—				
	Dueim ...	89	—				
	Sennar... ...	156	—				
	Singa	150	—				
	Roseires ...	131	—				
	Rufaa ...	40	—				
Darfur ...	El Fasher ...	202	—	57	310	784	0.50
	Nyala ...	100	—				
	Geneina ...	96	4				
	Zalingei ...	72	—				
Equatoria ...	Juba	345	32	89	377	1,422	1.52
	Yei	91	—				
	Meridi ...	120	—				
	Li Rangu ...	110	20				
	Torit	124	—				
	S. Yubu ...	121	—				
	Kapoeta ...	82	—				
Kassala ...	Kassaa ...	280	20	77	189	1,091	1.54
	Gedaref ...	214	—				
	Port Sudan ...	280	68				
	Tokar ...	40					
Khartoum ...	Khartoum ...	332	—	49	—	1,149	2.01
	Omdurman ...	265	—				
	Khtm. North	110	—				
	Abu Deleig ...	40	—				
	Eye Hospital	94	—				
	River (Chest)	—	94				
	Abu Anga ...	—	74				
	Omd. Maternity	40					
	Medical Corps	100	—				

Province	Hospitals 49	Beds in Hospitals		Number of dispensaries and Dressing Stations	Beds in Dispensaries	Total Beds	Beds per 1,000 Population.
		Gen.	T.B.				
Kordofan ...	El Obeid ...	321	28	84	561	1,404	0.45
	Kadugli ...	128	—				
	Abu Gebeiha	100	—				
	Nahud ...	120	—				
	Dilling ...	86	—				
	Talodi ...	60	—				
Northern ...	Atbara ...	242	15	114	21	789	0.90
	Wadi Halfa ...	219	—				
	Merowe ...	86	—				
	Dongola ...	76	—				
	Shendi ...	100	—				
	Berber ...	30	—				
Upper Nile ...	Malakal ...	309	28	437	193	621	1.09
	Bor ...	100	—				

Three new hospitals were opened during the year at Abu Deleig, Abu Gebeiha and the Maternity Hosptal in Omdurman. Singa and Berber Hospitals have been completed.

Four additional Hospitals at Raga, Kurmuk, Rigl El Foula and Bentiu have been approved and are under construction.

Medical Services Buildings completed during the year includes :—

Province	Locality	Buildings Erected
Blue Nile	Medani	Dental Centre.
	,,	Additions to Hospital Kitchen
	Abu Usher	X-Ray Department.
	,, ,,	TB. Ward.
	Medani	House for A/Radiographer
	Singa	House for M.I.
	Medani	New Hostel for T.B.
	,,	Hostel for Health Visitors Trainees
	,,	Hostel for Housemen
	Gezira I.A.	2 houses for M.As.
	,,	House M. A.
	Fasher	X-Ray Department
	Geneina	2-20-bedded wards
	,,	Kitchen laundry
	,,	House for A/P.M.O.H.
	,,	House for A/Radiographer
Kassala	Port Sudan	Dental Centre.
	Tokar	20 bedded ward
	Port Sudan	Quarter for Dental Surgeon
	,, ,,	Quarter for Ophthalmologist.

Province	Locality	Building Erected
Khartoum	Eilafoun	House for M.A.
	Deim Sied	House for M.A.
	Tuti Island	House for M.A.
	Omdurman	Maternity Hospital.
	Abu Deleig	New Hospital.
Kordofan	Abu Gebeiha	,, ,,
	El Obeid	Dental Centre
	,, ,,	T.B. Ward
	,, ,,	Extension to Obst. Dept.
	,, ,,	Additions to Theatre
	,, ,,	Extension to M.I. School.
	,, ,,	Quarter for Dental Surgeon.
Northern	Atbara	Dental Surgeon
	,,	O.P. Dept. Eyes
	,,	Boundary wall for hosp.
	,,	Quarter for Ophthalmologist
	,,	,, ,, Dental Surgeon.
	,,	,, ,, A/P.M.O.H.
	,,	,, ,, S.P.H.I.
	,,	3 quarters for Staff
	,,	Hostel for 3 housemen
	Dongola	Quarter for M.I.

The programme of expansion of dispensary services was maintained. Additions included :—

Province	New Dispensaries	New Dressing stations	Dispensaries Improved
Blue Nile	2	—	3
Darfur	2	—	4
Kassala	3	—	6
Khartoum	2	10	4
Kordofan	2	—	3
Northern	2	—	7
Upper Nile	1	—	—
Total	14	10	27

MOBILE RURAL HEALTH UNITS.

List showing the distribution of the 65 especially designed and equipped ambulances :—

Khartoum Province	4
Bahr El Ghazal Province...	4
Equatoria Province	4
Upper Nile Province	4
Kordofan Province...	13
Blue Nile Province	8
Northern Province	10
Port Sudan Area	3
Darfur Province	6
Kassala Province	4
Gezira Irrigated Area	4
Ex Rumbek Rural Council	1
TOTAL	65

SPECIAL DEPARTMENTS.

Dental Centres	7
Eye Centres	8
X-Ray Department	2

CHAPTER VII.

MEDICAL MISSIONS.

Medical Missions. The work reported by Medical Missions is shown under :—

Unit	In-patients	Out-patients	Operations
CHURCH MISSIONARY SOCIETY.			
Omdurman (Khartoum Province) ...	1,021	48,856	304
Sallara (Kordofan Province) ...	—	6,687	—
Katcha ,, ,, ...	239	8,088	—
Lui (Equatoria ,,) ...	1,343	141,829	672
AMERICAN MISSION.			
Doleib Hill (Upper Nile Province) ...	—	22,063	—
Akobo (,, ,, ,,) ...	—	8,514	—
Pibor (,, ,, ,,) ...	—	19,838	—
SUDAN UNITED MISSION.			
Abri (Kordofan Province) ...	332	30,680	—
Tabanya (,, ,,) ...	37	10,426	—
Heiban (,, ,,) ...	167	19,657	—
Moro (,, ,,) ...	34	871	—
Kauda (,, ,,) ...	259	20,397	—
SUDAN INTERIOR MISSION.			
Doro	—	3,143	—
Banjang	—	3,930	—
Maaban	—	1,003	—
TOTAL	3,432	345,982	976

CHAPTER VIII

MEDICAL TRAINING

School of Hygiene. 28 students were under training of whom 8 sat for the final examination in March and all passed and received the Diploma of the Royal Sanitary Institute, England. Another batch of 8 students has been taken for the first year class to complete the three classes of the School.

5 Sanitary Overseers have undergone a course of 6 months training.

20 Demonstrations were given to medical students in the School. 25 medical assistants, 34 hospital nurses and 16 Executive Officers received lectures on Public Health, which will equip the latter to solve problems that they might face when handling their duties which brings them in contact with their personnel and public.

Medical Assistants Training School. 29 students were under training and sat for their final examination. Of this number, 27 have successfully passed and were qualified.

Work on the new building of the School has been completed.

Laboratory Technicians. 6 are under training. They will complete their 3 years course in 1959.

Radiographers. 9 are under training.

Juba Training Centre.

Medical Assistants. 5 students were qualified during the year.

Sanitary Overseers. 7 qualified as Sanitary Overseers.

Nurses Training School. There are 30 schools in various hospitals recognised for the " in service " training. Of these 12 are for the full 3 years course and 18 for the short 2 years course.

283 Mumarideen and 40 Mumaridat received their certificates during the year.

CHAPTER IX.

(a) STACK MEDICAL RESEARCH LABORATORIES.

By Dr. M. A. Haseeb.

This report covers the period from July 1st. 1955 to June 30th. 1956. During this period *ad hoc* investigations were carried on intestinal parasites, schistosomiasis, kala-azar, enchocerciasis, the effect of cortisone on rabies and neoplasms. Summaries of these and other research activities will be found under the appropriate headings.

A great part of the time was devoted to the teaching of laboratory technicians, recruited from the secondary schools.

Among visitors to the laboratories were Prof. H. L. Wolff of the Institute of Tropical Medicine, Leyden University, Holland who spent several days in the laboratories discussing several problems of mutual interest, also Dr. Friedheim of New York spent sometime in the laboratories and then left for Wau, Bahr el Ghazal Province to try his new trivalent antimony drug TWS b on Hetrazan-resistant strains of *Onchocerca volvulus*.

The writer attended a seminar on rabies held jointly by the World Health Organisation and the commission for technical co-operation in Africa South of the Sahara at the East African Veterinary Research organisation laboratories in Muguga, Nairobi. The seminar was attended by delegates from 30 interested countries. The discussion was led by authorities on the subject.

EDUCATIONAL AND ROUTINE ACTIVITIES.

Ten laboratory assistants have done three-months refresher courses on new laboratory techniques including the Kahn test. It has also been possible to give training to one of the staff of the Veterinary School of Khartoum University.

Four laboratory assistants were detailed to carry out a survey on intenstina and urinary parasites in Khartoum Province. They completed a systematic survey of the Province moving with their microscopes and other apparatus from village to village. Two laboratory assistants were devoted to Kalaazar work in the Fung area.

It has been possible to give permanent secondment of one laboratory assistant to the Medical Corps of the Sudanese Army.

As usual the teaching of academic and practical bacteriology to the medical students in the Faculty of medicine, Khartoum University and also the teaching of Forensic medicine to the same students have made heavy demands on the time of the laboratory staff.

TECHNICIANS CLASS.

Three technician trainees completed the course on advanced bacteriology, haematology, biochemistry and pathology and passed the final examination successfully in April 1956. They were posted temporarily to the Stack Medical Research laboratories to fill the posts vacated by the exodus of the British technicians who left the service on their own accord under the compensation regulations. These three technicians were quite capable of shouldering all responsibilities of their predecessors and they met a real need.

The remaining two trainees continued their studies.

ROUTINE WORK.

A summary of the work and examinations carried out during the period under review is appended to the report. The total number of examinations was 31,880 as compared with 31,703 in the previous year and 34,452 in 1953-54.

Histopathological work of rather highly specialised routine continued to increase ; demands for the examination for fertility from endometrial curettings and biopsies from tests became common. Bronchial biopsies for cancer of the lung are new additions to the special histopathological requests.

The issue of lymph vaccine increased from 2,731,080 doses last year to 3,100,000 doses this year. There is a great increase in the demands for anti-rabic vaccine ; the issues increased from 40,000 doses in the previous year to 43,200 doses this year.

POST MORTEM EXAMINATIONS.

30 Post mortem examinations were performed in Khartoum Civil Hospital in the year under review. Of these 20 were medico-legal. Four Post-mortem examinations were performed in Kosti Civil Hospital on bodies of tenants who died as a result of heat exhaustion.

PATHOLOGICAL SPECIMENS.

The total was 1246 excluding brains for rabies, the total for the previous year was 836.

NEOPLOSUS.

73 Neoplasms were received of which the following table is a summary :—

TABLE.

Malignant Tumours.

SITE	Carcinoma	Sarcoma	Melanoma	Mixed	Total
Abdomen	1			1	2
Anal Canal	3				3
Breast	9				9
Bladder	1				1
Cervix	5				5
Cheek	1				1
Eye	2		1		3
Endometrium	2				2
Foot	3		2		5
Forearm	1	2			3
Groin			1		1
Jaw	2				2
Kidney	1				1
Leg	5		1		6
Lip	1				1
Lung	1				1
Lymph gland		1			1
Mesentry		1			1
Neck	2	2			4
Nipple	1				1
Axilla	1	1			2
Omentum		1			1
Oesophagus	1				1
Palate	1				1
Parotid	1				1
Penis	1				1
Prostate	3				3
Testicle	1				1
Thyroid	3				3
Thigh	1				1
Uterus	1				1
Ulcer	1				1
Unspecified	3				3
TOTAL	59	8	5	1	73

RABIES.

270 brains were received of which 32 were decomposed and useless for examination. 67 of the remaining 238 were positive for Negri bodies. This contrasts with 70 positive out of 209 received last year.

The species and distribution of the positives and negatives in the past year series is shown in the following table :—

TABLE.

Rabies Examination.

ANIMAL	Positive	Negative	Decomposed	Total
Dog	40	131	26	176
Cat	3	17	—	20
Donkey	10	10	3	23
Goat	6	—	—	6
Monkey	3	5	—	8
Sheep	—	2	—	2
Ratel	—	1	—	1
Cow	3	1	—	4
Camel	1	1	2	4
Calf	1	—	1	2
Bitch	—	2	—	2
Fox	—	1	—	1
TOTAL	67	171	32	270

RABIES VACCINE.

43.200 mls. were issued this year compared with 40,900 mls. issued last year The amount issued this year is sufficient to treat 576 cases. The methods and techniques recommended by the W.H.O. seminar on rabies at Muguga, Nairobi were adopted and followed by the Stack Medical Research laboratories. Goats are now used instead of sheep ; they are cheaper and produce practically the same amount of vaccine. Potency tests on the vaccine are performed according to the method of Dr. Habel of the National Institute at Bestheda, U.S.A.

As in previous years owing to the fact that anti-rabic treatment is decentralised and the vaccine is sent out to the provincial hospitals on demand a certain amount of waste is bound to take place.

LYMPTH VACCINE.

135 sheep were used for the production of 7020 grams of pulp with an average of 52 grams. Owing to several small outbreaks of small-pox in the Southern Provinces the issue of lympth vaccine has increased.

ENTERIC FEVER.

Small outbreaks of Enteric infections continued to appear in various parts of the country. As usual the commonest consative organism is *Salm-typhi.* Several strains were collected from various districts and sent to the Director, the Central Enteric reference laboratory, Bureau Colindale, London, for favour of phage-typing. Type E seems the commonest type in the country.

INTESTINAL AND URINARY PARASITES IN THE SUDAN.

The survey on intestinal and urinary parasites on School children which had been started in Khartoum Province last year was completed this year and the results of the survey would be the subject of a separate publication (Haseeb and Khalil, in the press).

SCHISTOSOMIASIS.

Opportunity was taken of the availability of a small amount of di-(antimony) tri-(a,a, 'dimercapto succinate). Dr. Ernst A. H. Friedheim's new preparation of antimony known as TWS b (di-antimony tri-(a,a 'dimercapto succinate) and trials were carried on two cases of schistosomiasis.

The particulars of the two cases were as follows :

Case No. 1. An arab boy aged 14, who comes from the Gezira irrigated (Miheiriba) area was suffering from a double infection with *S. mansoni* and *S. haematobian*. Treatment was started with intravenous injections of 0.20 gram. daily until a total of 1.375 grams was given. The weight of the patient was 66 pounds. Specimens of urine and stools were collected daily and examined for ova. No toxic signs were observed. The patient continued to pass ova in the urine and stools till the treatment was completed and no changes in the cellular contents of the urine were seen.

Case No. 2. An arab boy aged 8, who comes from Southern Darfur (Dien) was suffering from *S. haematobian*. Treatment was started with intravenous injections of 0.2 grms. daily until a total of 1.650 grms. was given. The weight of the patient was 58 pounds. Specimens of urine were collected daily and examined for ova. There was no evidence of toxicity to the patient, who continued to pass ova throughout the treatment and showed no improvement in the cellular contents of his urine.

Owing to the fact that the drug available was limited in amount it was not possible to treat more cases. As it is obvious it is difficult to draw conclusions for the result of the treatment of these two cases of Schistosoma. Further trials are certainly indicated.

CONTROL OF BILHARZIA.

A significant paper was published by H. Sharaf el Din and H. El Nagar on the control of snails by copper sulphate in the canals of the Gezira Irrigated Area of the Sudan (Journal of Trop. Med. and Hygiene (1955) Vol. 58, No. 11, 260). The findings of these two workers can be summarised as follows :—

1. The Gezira canalization system is heavily infested with several species of mollusca including the intermediate hosts of Schistosoma haematobium and S. Mansoni ; bilharziasis is common in the farming population.
2. The intermediate hosts are Buulinus trancatus for *S. haematobium* and *Biomphalaria boissyi* for *S. Mansoni*.
3. Snails multiply mainly during the short closure period in both the main and major canals ; during the flood period they are washed into the minor canals.
4. Clean weeding and an initial application of copper sulphate at a dose of 30 parts per million followed by a maintenance dose of 0.125 part per million, applied as a chemical barrier at the commencements of canals, controls snails in the system.

5. Copper sulphate is cheaper and easier of application than sodium pentachlorophenate.

SINDBIS VIRUS.

This virus was first encountered in 1952 in a group of culex mosquitoes captured in Sindbis, 30 kilometeres north of Cairo. Isolation was made by inoculation of the triturated mosquitoes with three-day-old mice. Sindbis virus is a new member of the arthropod-transmitted viruses. It is as yet a virus without a disease. The virus seems to be endemic in the Nile Valley and its principal vector is the culex mosquito, although it is possible to infect *Orinthodoras savignyi* ticks. Immunity surveys indicate that the virus is widely distributed in the Nile Valley and that it has a wide host range including man, domestic quadrupeds and avian species. Neutralisation tests were performed on 132 sera collected from residents of the Sudan and the result is tabulated as below :—

TABLE.

RESULTS OF NEUTRALIZATION TESTS ON HUMAN SERA ARRANGED ACCORDING TO LOCALITY AND TO AGE GROUPS BELOW 15 YEARS, AND 15 YEARS AND OVER.

	Less than 15 years			15 years and over			All ages.		
	No. test	No. pos.	% pos.	No. test	No. pos.	% pos.	No. test	No. pos.	% pos.
Khartoum	18	0	0	25	0	0	43	0	0
Nahud	11	0	0	8	1	—	19	1	5
Malakal	17	2	12	16	8	50	33	10	30
Mayen Mission	8	2	—	1	1	—	9	3	—
Juba	16	1	6	12	1	8	28	2	7
TOTAL ...	70	5	18	62	11	18	132	16	12

As it is obvious positive vectors were found in all of the five localities sampled with the exception of Khartoum, the physical properties of the virus and its edpidemiology were discussed by Richards M. Taylor *et al* (1955) in the American Journal of Tropical Medicine and Hygiene, Vol. 4, No. 5, 844.

MYCETOMA IN THE SUDAN.

The term "mycetoma" was first used in 1860 by Van Dyke Carter to denote a fungus tumour of the foot, common in Madura, a Province of India. In 1916 Chalmers and Archibald suggested divisions of these tumours into two groups actinomy-coses and maduro-mycosis.

Following the work of Dr. Inan E. Mackinnon of the Institute of Hygiene, Faculty of medicine, Montevideo, Uruguay (Tr. Roy. Soc. Trop. Med. & Hyg. 1954, Vol. 48, No. 6, 470). Dr. Peter Abbott, carried out further investigations on the cansative organisms. His findings were the subject of a separate publication (Abbott, (1956) Tr. Roy. Soc. Trop. Med. & Hyg. Vol. 50, No. 1, 11).

ANTIBIOTICS IN MADUROMYCOSIS.

A trial of Terramyein on eleven cases of maduromycosis was carried out in Khartoum Civil Hospital by Dr. Slade, Prof. H. Morgan, of the Faculty of Medicine, University of Khartoum and the present writer (Slade, Haseeb and Morgan (1956) Journ. Trop. Med. & Hyg., Vol. 59, No. 11, 262). In none of the cases in whom an adequate follow-up was possible can lasting benefit be shown to have resulted from treament. However some striking changes were noted following the oxytera-cycline treatment. These are summarised below :—

TABLE.

SUMMARY OF RESULTS OF TREATMENT.

TYPE OF DISEASE	No. of cases	Results of Biopsy at end of treatment		Effect of treatment on size of swelling	
		Fungus present	Fungus absent	Dimunion in size.	No Effect
Black	6	3	3	4	2
Yellow	5	3	2	4	1

When compared with the long course of penicilin necessary in the treatment of actimycosis, the period of one month of oxyteracycline therapy, must appear short. The initial improvement often obtained does, indeed, give some encouragement to the idea that a really long term of treatment might be successful.

It is felt that this small series has shown that oxyteracycline has at least some effect on the fungus causing mydromycosis, and that further trials of drug treatment for this disease are indicated.

THE EFFECTS OF HEAT ON MAN.

The classical effects of heat on man which may manifest themselves as heat cramps, heat exhaustion or heat stroke are well known. The episode at Kosti was an example of such effects. Briefly speaking the incident was as follows :—

On Thursday 21st of February, 1956, some 281 tenants were arrested by the police from the Hawashat and villages of Goda Irrigation Scheme, 90 miles south of Kosti town. These people were carried in lorries in the middle of the day from Goda to Kosti where they were confined in a newly built ward of 19 metres long by 5.5 metres wide by 3.8 metres high with cement floor. The windows and doors were well closed. The walls are made of red bricks. The maximum, minimum temperatures and relative humidity for that night were as follows :—

Maximum temperature .... 103.8° F.

Minimum temperature .... 69.6° F.

Relative humidity :—

At 8 p.m. 19%

At 11 p.m. 48%

At 2 a.m. 60%

At 5 a.m. 47%

The inmates were locked up in the ward at 7.30 p.m. On opening the ward next morning 187 persons were found dead. 11 were found seriously ill with shock, thready pulse and vomiting. A detailed description of the episode will be the subject of a separate publication.

TICKS.

A most valuable reference book on ticks of the Sudan has been compiled by Harry Hoogstraal, Head of the Department of Medical Zoology, U.S. Naval Medical Research Unit No. 3, Cairo. "African Ixodoidea, Volume I, Ticks of the Sudan" is a comprehensive work presenting sound information on the distribution of the ticks in the Sudan, their hosts, biology and identification. The nucleous of this work was gathered by the U.S. Naval Medical Research Unit at Torit, Equatoria in 1949. Further collections were made in 1950, 1951 and 1952. Apart from the study of the collected specimens the book contains an extensive survey of the literature and past collections of the ticks in the Sudan.

EFFECT OF CORTISONE ON THE INCUBATION PERIOD OF RABIES FIXED VIRUS ON MICE.

A small experiment has been devised to study the effect of cortisone on the incubation period of rabies fixed virus in mice. It was also intended to utilise the information so acquired for the development of further points of practical application in the management of rabies, if the results are encouraging.

As a matter of fact, this study is evisaged as a prelude to a second experiment in which the action of anti-biotics as well as cortisone is to be tested on mice infected with rabies fixed virus. Theoretically this is supposed to work on the plausible hypothesis that cortisone may arrest or delay inflammatory reaction. This may give time for the antibiotics to act on the virus, if it has any viricidal properties at all.

EXPERIMENTS.

6 mice were inoculated intra-cerebrally with a normal saline emulsion of rabies fixed virus ; 0.03 ml. of 1/100 emulsion was injected into each mouse. The next day, however, 2.5 grms. cortisone were injected subcutaneously into each mouse daily.

RABIES CONTROL.

6 mice were injected with the same amount of emulsion of rabies fixed virus intra-cerebrally as mentioned previously to act as control.

CORTISONE CONTROL MICE.

A third set of 6 mice was injected with cortisone to act as cortisone control. Each mouse was given 2.5 m mgs. subcutaneously.

RESULTS.

The results are interesting and clear-cut although the number of animals used is small.

Of the rabies control mice, one died on the 3rd day of inoculation, from trauma two died on the 5th day and all the others (three) became ill on the 6th day but died on 7th, 8th, and 10th day of inoculation. They all had paralysis and typical signs of rabies.

CORTISONE CONTROL MICE.

All 6 mice also died. 5 mice died on the eighth day and the 6th mouse died on the 14th day. Three of them developed orchitis and swelling of thighs. One died on the 5th, another on the 6th and two on the 7th day, while one died on the eighth day.

TEST MICE.

Cortisone was started 24 hours after the intra-cerebral inoculation with fixed rabies virus. By the 6th day, 5 died and the one became paralysed on the 9th day.

CONCLUSION.

The following points emerge after evaluation of the results of the above experiments.

It is obvious from the action of cortisone that the inoculation period of rabies fixed virus in mice has been greatly shortened as by the 4th day, 4 mice died out of 6. On the 6th day, however the 5th mouse died and the 6th became paralysed. Although completely comotosed and paralysed since 6th day, the 6th mouse died on the 9th day of inoculation.

Those mice that were inoculated intra-cerebrally with rabies fixed virus and given no cortisone injections, had one death on the 3rd day which was due to trauma, while two died on the 5th day The remaining three mice, although showed signs of illness, sweating and emaciation and weakness on the 6th day, were all alive after 5-6 days ; one, however, died on the 5th, the 2nd on the 8th and the 3rd on the 10th day of inoculation.

As to the batch on cortisone all died on the 14th day. The 1st died after 5 consecutive daily injections of 2.5 m/mgs. of cortisone each, the second died after 6 injections ; two died after seven injections, while the 5th died after 8 injections. The last one (sixth) died after having had 14 injections. Some of these mice showed swelling of testes, thighs as well as the joints of the hind limbs.

The fact that some developed swelling of thighs and testes with cortisone injections is interesting as the usual finding is that cortisone temporarily arrests the inflamatory reaction and swellings. In this case the opposite is true. It is therefore suggested that this orchitis and swelling of thighs might be due possibly to a virus infection which has been flared up by cortisone. Another interesting fact that emerged is that cortisone invariably killed all the mice.

MAMMALS OF THE SUDAN.

The work on mammals in the Sudan has been completed and published in book form by Henry W. Selzer, Assistant Curator of mammals at the United States National Museum. The book includes the taxomomic status and distribution of some 90 general and 225 species and subspecies of non-chiropteram land mammals. The book is a very valuable reference work and served a real need.

SUMMARY OF ROUTINE EXAMINATIONS.

From 1st July, 1955 to 30th June, 1956.

Kahn tests	16,807
Widals	2,438
Weil-Felix	4
Heterohhile agglutination (Paul Bunnel)	8
Blood cultures	1,177
Blood films	667
Blood counts	307
C.S. Fluids	332
Medico-legal (Blood and Seminal stains)	269
Biochemical tests	1,288
Autogenous vaccines	1
Pathological histology (including rabics)	1,246
Faeces	1,569
Urine	2,793
Throat and Nasal swabs for C. diphtheria positive	37
,, ,, ,, ,, ,, ,, negative	985
Sputum for myco tuberculosis positive	21
,, ,, ,, ,, negative	235
General bacteriological examinations	1,586
Water tcsts	110
TOTAL	31,880

Summary of Faeces Examination.

Shigella flexneri V—Z	43
Shigella shigae	2
Shigella sehmits	—
Salm-typhi	23
Paratiphi A.	2
Paratiphi B.	1
Entamoeba histolyties	5
Ova present	6
Negative	1,483
TOTAL	1,565

Summary of Urine Examination.

Salm typhi	10
Paratyphoid B.	1
Ova	2
Negative	1,213
	1,226

Summary of Kahn tests.

Positive	3,015
Negative	13,792
TOTAL	16,807

Summary of Blood Films.

Benign tertian Malaria	—
Subtertian Malaria	35
Negative	632

Kalaazar

Positive	4

Summary of Widal Reaction.

Salm typhi	275
Paratyphii A	1
Paratyphii B	7
Br. Melitensis	95
Negative	2,030

Summary of Blood Culture.

Salm typhi isolated	47
Paratyphii A. isolated	5
Paratyphii B isolated	22
Br. Melitensis isolated	—
Streptococcus pyogenes isolated	6
Negative	388
Sterile contaminated	671
Other organisms	38
TOTAL	1,177

Summary of Heterophile Agglutination tests.

Positive	Nil.
Negative	8

Summary of Weil Felix Reactions.

Positive	Nil.
Negative	4

Summary of Vaccines Issued.

T.A.B. Vaccine	28,950
Anti-rabic vaccine	432,000
Cholera vaccine	72,800 doses
Lympth vaccine	3,100,000

LIST OF PUBLICATIONS DURING THE YEAR BY MEMBERS OF THE STAFF.

Name and initials of author	Date of Publication	Title of Article	Title of Journal in which Published	Volume number of Journal	Page number of Journal
Haseeb M. A. and Ramadan, K. A.	1956	Intestinal and urinary parasites in the Sudan.	In the press		
Haseeb, M. A. and Fayiz Amin	1956	Effects of heat on man	In the press		
Slade, P. R. Haseeb M. A. and Morgan, H. V. ...	1956	Oxytetracycline in the treatment of Maduromycosis.	Journal of Tropical Medicine and Hygiene	Vol. 59, No. 11.	262

(b) WELLCOME CHEMICAL LABORATORIES.

This report refers to the work carried out at the Wellcome Chemical Laboratories during the year ending 30th June 1956.

STAFF.

Mr. E. H. W. J. Burden, B.SC., A.R.I.C. Assistant Government Analyst was appointed Government Analyst.

Rifat Eff. Butros Salama B.SC., Assistant Scientific Officer, was appointed Assistant Government Analyst.

Salah El Din Eff. Bedawi El Sawahli was appointed as Technical Assistant, Hassan Eff. Ahmed Yassin was promoted to Technical Assistant.

Abdel Hamid Eff. Ibrahim Suliman, B.SC., continued his studies at the Imperial College, London, where he is reading for an M.Sc. degree.

ANALYTICAL REPORT.

The following table shows the number of samples received during the year in different categories compared with last year's figures :

	1955/56	1954/55
Waters and Effluents	371	254
Foods	551	232
Drugs and Poisons	50	17
Clinical Specimens	40	17
Toxicological Specimens	137	136
Forensic Specimens	35	6
Mineralogical Specimens	58	53
Edible Oils, Seeds and Oilcakes	484	357
Damaged Materials	221	161
Miscellaneous	274	379
TOTAL	2,221	1,612

These samples came from the following sources :

	1955/56	1954/55
Ministry of Health	810	368
Other Official Sources	601	636
Commercial Firms	810	608

Analytical fees amounted to £E. 1,971.000 m ms., compared with £E. 1,760.000 m/ms. last year and £E. 946.000 m ms. the year before.

WATERS AND EFFLUENTS.

Samples of water were received from the following sources :—

Ministry of Health	97
Drilling Engineer, (Ministry of Works)	103
Geological Survey Department	10
Sudan Gezira Board	71
Other Sources	90
TOTAL	371

A number of trade effluents were taken by the Government Analyst in connection with the proposal to discharge untreated industrial effluents into the Blue Nile. After consideration of the numberous factors involved the Government Analyst advised that this scheme be rejected.

FOODS.

The following table shows the numbers of foodstuffs received for analysis :

	1955/56	1954/55
Official Samples	470	183
Other Samples	81	49
TOTAL	551	232

The offieial samples were submitted in order to test for absence of adulteration and for fitness for human consumption. Of the 470 samples submitted 243 were found to be unsatisfactory.

These included the following :

Milk. 17 out of 78 samples were watered. One sample contained as much as 77 per cent. of added water.

Arsenical Wines. An outbreak of food poisoning at Kosti led to the discovery of arsenical spray residues in Egyptian wines. Altogether 101 Egyptian wines were tested, and only 4 were found to contain less than 0.1 p.p.m. arsenic as As — the recommended English limit. After a long hearing lasting nearly three days during which Sudanese, Egyptian, German and British expert witnesses were heard, the learned magistrate, Sayed Tewfik Cotran upheld the Government Analyst's contention that all wines containing more than 0.1 p.p.m. arsenic were unfit for human consumption. Wines to the value of £E. 8,000 were affected by this order.

All the wines from other countries so far examined have contained less than 0.1 p.p.m. arsenic.

Coffee. Reference was made in the last Annual Report to a case of coffee adulteration. A successful prosecution was made and fines totalling £E. 80 were imposed.

Two other cases of adulteration were discovered during the year. In one case fines totalling £E. 70 were imposed. in the other, the case was dismissed but the coffee was withdrawn from sale.

Vegetable Ghee. Some concern is felt over the sale of large quantities of hydrogenated vegetable oils under the description "Vegetable Ghee" (Samna Nabbatia). This description is forbidden in several parts of the world, including India and Pakistan. Although ghee is not used in England, the title "vegetable ghee" would be forbidden under the Merchandise Marks Acts and the corresponding term "vegetable butter" is also forbidden. Ghee consists of rendered fat obtained from the milk of cows, buffaloes, sheep and goats. The title "vegetable ghee" is deliberately chosen to "pass off" a cheaper article under a more attractive name, and local tradesmen admit that if they sell it is as vegetable oil or vegetable fat, the sales fall sharply. As such, the description is intended to mislead. Unfortunately, the present law seems unable to deal with such a situation.

What appears to be the height of deception is the product called "Cow Brand Vegetable Ghee." This description, which is a registered trade mark, is used with a colourful picture of a cow and a milk-maid. Much of this vegetable fat is sold in small quantities by retailers from the opened tin. It is at least plausible to think that an illiterate person buying ghee and seeing a tin bearing a large picture of a cow on the side would think that the fat therein came from a cow. Since this product is made by a Dutch firm who must be aware that the description is strictly forbidden in many parts of the world, it can only be assumed that it is deliberately chosen to deceive the public. Unfortunately, attempts by the Government Analyst to have this case brought into court have met with failure.

Samin. One adulterated sample contained about 70 per cent arachis oil and 18 per cent sesame oil. Another adulterated sample contained 10 per cent. arachis oil.

Fruit Squashes. A number of samples were found to be heavily contaminated with poisonous metals. One sample contained 35 p.p.m. lead, another sample contained 40 p.p.m. zinc. Such contamination is due to sheer carelessness, but could have severe consequences. Appropriate action was taken by the Public Health Authorities.

Another sample was found to contain excessive amounts of preservative. A preservative is added as a bacteriostat to prevent spoilage. Excessive amounts may cause digestive trouble by killing the gastric organisms that perform the function of digestion. The manufacturer was warned and a later batch was found to contain much less.

Several samples sold as "Orange Juice" were found to contain nor orange juice. Cautions were given, and they were sold as "Orange Drink."

DRUGS.

Most of the samples were examined for purity and compliance with pharmacopoeial specifications. A number of old samples were found to have decomposed and become unfit for use. In some cases, their use might have been dangerous. In a country like the Sudan decomposition is often accelarated by the high temperatures, and it requires great care on the part of pharmacists and storekeepers to keep a proper rotation of stocks and to treat old drugs with suspicion.

CLINICAL SPECIMENS.

A total of 40 specimens were examined. Because of the lack of qualified staff in the Stack Medical Research Laboratories, these laboratories have often assisted them by doing non-routine determinations. With the advent of some experienced technicians, it is hoped that the Stack Laboratories will be able to do most of these non-routine estimations.

TOXICOLOGICAL SPECIMENS.

137 samples were received, and included the following :

(*a*) *Human Poisoning.*

(i) One case of barbiturate poisoning.

(ii) One case of abnormally high zinc.

(iii) One case in which a blue flourescent compound was found. It is suggested that this compound may be methyl aesculetin, which is found in belladonna and jasmine.It is hoped to do some research into this point in the coming year.

(iv) Two cases in which hashish was identified in the stomach contents.

(v) One case of morphine poisoning.

(b) *Animal Poisoning.*

(i) One case of arsenic poisoning.

(ii) One case of D.D.T. poisoning.

(c) *Plant Materials.*

(i) One unknown plant submitted in a case of suspected poisoning was found to contain hyoscyamine.

(ii) Four plant materials were identified as hashish.

FORENSIC SPECIMENS.

A total of 35 samples were received. They included the following interesting cases.

Methylated Sprits	3
Pair of Pincers	1
Cloth	3
Hammer	1
Paint Scrapings	1
Pieces of Paper	18
Coins	2
Perfumes	6
TOTAL	35

The pair of pincers had fine fragments of yellow metal adhering to the jaws. and it was suspected that they had been used for breaking down stolen gold articles. It was proved that the metal was brass and not gold.

Three pieces of rag cloth were submitted in connection with a case of suspected arson. Two burnt pieces had been found on the scene of the fire, and the third piece in the possession of the suspect. It was shown that the cloths were identical, had probably been sewn on the same machine, and might have come from the same original garment.

The hammer received had some paint and a piece of paper adhering to the head. It was suspected that it had been used in attempting to break open a stolen safe. The paint scrapings and fragments of paper were removed from the recovered safe and submitted for comparison. It was shown that the paint scrapings were different from those on the hammer, and that the adhering paper was a piece of cigarette paper, different from those submitted.

The coins were a counterfeit English florin, and a genuine coin for comparison

Three samples of perfume were submitted with genuine samples. It was shown that the original samples had been adulterated.

MINERALOGICAL SPECIMENS.

The 58 samples submitted included 23 samples of coal, 10 laterites, 4 minerals and 10 metals.

EDIBLE OILS, SEEDS AND OILCAKES.

The following were submitted for analysis :

	1955/56	1954/55
Cottonseeds	172	141
Groundnuts	20	14
Sesame Seeds	51	14
Melonseeds	0	1
Maize	1	0
Beans	3	1
Dari Meal...	2	0
Edible Oils	73	38
Oilcakes	162	148
	484	357

DAMAGED MATERIALS.

All of the samples in this section were submitted in connection with insurance claims. 221 samples were submitted compared with 161 last year and 38 the year before.

MISCELLANEOUS SAMPLES.

274 samples were examined, these included a large number of coins and proofs submitted in connection with the design of the new Sudan coinage. The dimensions of the new coinage are based on the advice of the Government Analyst.

Also included were samples of blankets, soap and canvas submitted as tenders to the Ministry of Stores and Equipment, and samples of methylated spirits, beeswax disinfectants, abavits and tobacco.

RESEARCH REPORT.

Although there is no lack of problems that require investigation, the great increase of routine samples severely restricted the amount of research work that could be done.

1. Composition of the Niles at Khartoum.

During the year, regular analyses of water samples taken from the Blue and White Niles at Khartoum were started. Regular analyses of the Khartoum mains supply which were started last year have been continued. This supply is taken from the Blue Nile, treated with alum, filtered and chlorinated. Regular analyses have not been done since Dr. Beam, first Government Chemist, made his investigations in the year 1904-7. Since that time dams have been built on both rivers which have changed the plant life of the rivers, and which may have affected the chemical composition.

These analyses are of particular interest to industrial users who may wish to utilise the Nile waters for their processes. Already several enquiries have been received.

Nimitti. During the year, the laboratories were glad to offer facilities to Professor A. W. A. Brown of Western Ontario University, Canada, and Dr. Ripper and other members of the staff of Pest Control (Sudan) Ltd. Work has started on collecting nimitti in various parts of the town and experimental spraying was conducted. In association with this work a number of samples of insecticide and river water were examined for D.D.T.

PUBLICATIONS AND REPORTS.

Since the only qualified chemists in government service in Khartoum are on the staff of these laboratories, many problems of a chemical or scientific nature are referred to these laboratories for advice. This consultation service has increased during the year. The following list shows some of the problems that have been referred to these laboratories during the year :

1. Effluent Disposal from Khartoum North Industrial Area.
2. Revision of Industrial Methylated Spirits Regulations.
3. Revision of specifications for Army Blankets.
4. Dimensions of the new Sudan Coinage.
5. Suggestions for regulations controlling Tea.

The Government Analyst was co-opted on the Khartoum Main Drainage Sub-Committee in order to advise on suitable standards for effluents.

The following reports and communications were published or prepared for publication :

1. Annual Report of the Government Analyst for the Year 1954 55.
2. Fish — A case of D.D.T. Poisoning.
3. What is Tea ? British Food Journal 1956.

CHAPTER X

SCHOOL OF HYGIENE.

School Facilities.

The School occupies its own buildings which has the great advantage of being next door to the Graphic Museum. The Graphic Museum which is also directly supervised by the principal of the School and which is extensively used by the students provides a very useful material of demonstrations and other visual studies.

Staff.

Principal.
A Principal.
Sanitary Overseer Teacher.
Clerk.

Board of Studies.

The Board of Studies in association with the school which consists of the A D. P.H. as Chairman, Principal School of Hygiene as Secretary, the Chief Public Health Inspector and A Principal as Members have held five Meetings during the year to discuss the different aspects of the school policy.

Basis of Education for School.

The basis of education on which training is superimposed is that of the 4th year secondary standard.

5 Sanitary Overseers have been examined during the year for possible selection for the school but the result of the examination was very discouraging, and none has been recommended for training as Public Health Officer Student.

General.

Asst. Sanitary Overseers.

These are local Government Officials and their training is based on a curriculum prepared by the Principal School of Hygiene. Their training outside is undertaken by the Local Senior Public Health Inspectors and those in Khartoum Province receive an organised course of training in the School of Hygiene.

Sanitary Overseers.

These are Ministry of Health Officials and candidates are drawn from the A Sanitary Overseers category by examination.

On selection, the candidates receive a six months training in the School of Hygiene, which includes an adequate number of demonstrations to supplement the lectures.

Public Health Officer Students.

The basic education now required is that of the secondary standard. Candidates for the school are required from those who have completed their secondary education. The selection is made by interview only.

The Students take up 3 years full time course at the end of which they must pass the R.S.H. examination before being awarded the Qualifying Certificate.

The curriculum is briefly as follows :—

First Year.

General Science, Building Science, Drawing and construction, Levelling, and Geometry. Given at Khartoum Technical Institute.

Second Year.

Entomology and Pest control, Helminthology, Protozoology, Bacteriology, Water Supply and Disposal of Waste Matter.

Third Year.

Food and food control, meat inspection, milk, food preparation and manufacture, housing, urban and rural planning, communicable diseases, school health, prison health, quarantines, airports and seaports control statistics, sanitary law, relations between councils and Public Health Staff, notes on training within industries.

The necessary demonstrations that supplement the lectures include visits to water works food preparation places, schools, prisons manufacturers and factories. of Public Health interest, and certain council meetings.

SCHOOL REPORT FOR THE PERIOD

1st July, 1955.— 30th July, 1956.

During the year 28 students were under training in the following classes :—

First Year	10
Second Year	10
Third Year	8

The eight third year students took the R.S.H. examination on 20th, 21st-22nd and 24th March, 1956.

The examination which was held in Khartoum, was conducted by Dr. Abdalla Omer Abu Shamma, Dr. Mansour Ali Hasseeb, Sayed Khalafalla Babiker El Bedri and Sayed Abdel Rahman El Agib, with the principal School of Hygiene in attend. ance.

Of the eight entrants four were successful in passing the examination, they were :—

Tarig Yousif.
Abdel Moneim Omer.
Felix H. Biago.
Shams El Din Hassan.

Of the unsuccessful entrants, one has been deferred for a period of three months to be examined at the end of July, 1956 and the other three have been deferred for one year.

Second Year.

The terminal examination for 2nd Year was held on 1st, 2nd, 3rd and 5th April, 1956.

The 10 students took the examination with the result of one failure and three boarder line pass.

All students who attained a pass mark below 60% have been warned in writing in order to work hard in the final term.

First Year.

The first year students entered the Building Dept. of the Khartoum Technical Institute on 2.8.1955 and continued their training till 15.4.1956 April.

Reports of their terminal examination held in the Khartoum Technical Institute have been received from the Head of Building Dept. who has remarked favourably on their work and behaviour.

The result of the examination was also found to be satisfactory.

The First Year course covers :—

(a) Technical drawing.
(b) General Science.
(c) Mathematics.
(d) Building Construction.
(e) Surveying.
(f) Painting.
(g) Building Materials.
(h) Sanitation.

Practical Training.

The daily practical training is being carried out in Khartoum city and its Rura area. Second and Third year students have specific districts for their daily practica training hour and on Thursdays they do full time inspection and report on insanitary premises and other food preparation places. Water and milk samples from Khartoum city are handled by the students.

As a part of the practical training the students used to visit the Gezira to obtain practical information on the Bilharzia and Malaria control and to attend certain Rural Council meetings and to have information on their Health Schemes and their actual relations with the Public Health Inspectorate Staff.

In the practical work scheme the students used to visit Kosti Meat Factory and when possible they visit Port Sudan and Suakin to have information on Port sanitation and disinfection work.

Annually during the school vacation between April—August the students, after being granted their leave, were posted to the different provinces to work under qualified Public Health Staff.

Unfortunately during this year financial difficulties have arisen which will curtail the practical scheme so as to exclude all outside visits.

However the possibility of confining the practical work to Khartoum Province only is now being considered.

The danger of this application has been elucidated by the Principal School of Hygiene and the Board of studies in correspondences and minutes of the Board to draw the attention of the Director for further steps.

Asst. Sanitary Overseers.

111 have been examined for selection of new batch of Sanitary Overseers but owing to financial obstacles the procedure has been withheld.

A Sanitary Overseers.

86 from the three towns have received a course of training in the school from 1.10.1955 to 31.3.1956.

Medical Students.

20 demonstrations on Public Health were given during the year to Medical Students.

Medical Assistants.

25 Students have been given a course of lectures on Public Health.

Health Visitors.

5 Pupils have attended a course on Public Health during the year. An examination was set with the result of one failure.

Hospital Nurses.

34 Hospital Nurses have received a course of Public Health lectures from 1.6.56 to 30.6.1956.

Local Government Executive Officers.

16 Candidates have attended a short course on Public Health from 15.4.56 to 24.4.1956. An examination at the end of the course was set with a satisfactory result.

Candidates from the Gold Coast.

Two candidates from the Goldd Coast Mr. John Hugh Evans and Mr. Isaac Benjamin Quakyi are attached to the School of Hygiene on fellowship from W.H.O. for one month training from 20th July to 19th August, 1956 to study details of the Graphic Museum and teaching methods employed in the School of Hygiene.

Candidate from Burma.

Dr. Thein, lecturer in School of Health Assistants of Burma has also spent a week studying teaching methods of the School of Hygiene.

Personalia.

The following distinguished persons have kindly visited the school during the year :—

Sayed Dr. Amin El Sayed Minister of Health, accompanied by Sayed Khalafalla Babiker El Bedri Chief Public Health Inspector.

Sayed Dr. Ahmed Ali Zaki, Director, Medical Services, Ministry of Health.

Members of the Public Health Seminar, held in November-December, 1955

Sir Eric Pridie, Colonial Office, London.

Dr. R. E. Anderson, Director Medical Services of Malaya.

Dr. Johns, Nigeria.

Dr. Taba. Deputy Director W.H.O. Alexandria.
Dr. Hafiz Amin, Ministry of Health, Egypt.
Dr. Lotfi Ahmed, Ministry of Health, Egypt.

Sayed Mohamed Fuad Galal
Sayed Faig El Iragi
Sayed Osman Khalil Osman
Sayed Yousif El Rous
} Members of the Arab League.

Buildings.

The Ministry of Works have carried out a complete maintenance work of the school and hostel buildings during the year.

The partition wall between Khartoum Civil Hospital and the School of Hygiene which has long been asked for. has been erected.

General.

Approval has been obtained during the year to feed the students in the hostel

This has been carried out by contract which has been maintained satisfactorily during the year.

The hostel garden has been greatly improved, bananas, guavas and a variety of vegetables were produced.

CHAPTER XI

THE GRAPHIC MUSEUM.

The Duties of Curator are assumed by Asst. Director (P.H.) Asst. Curator looks after all technical work in the museum while Principal School of Hygiene holds the supervisory responsibility of the museum.

There are one Technical Asst., two Model Makers and two Attendants.

Revision of sections, the keeping up to date of exhibits and routine work require much of the museum staff's time. In addition extensive programmme of work on outside exhibits and agriculture shows was carried out, at the same time maintaining a good standard of the museum.

The recorded visits to the museum by the general public during the year were 11,156.

The teaching facilities which the museum affords were taken the advantage of by the students of the senior class of Medical Students, by students of the school of Hygiene, medical assistants class and by junior hospital staff.

Translation into Arabic of the matter contained in the museum was continued during the year.

Permanent Exhibition.

The following material was added during the year :—

Photographs	14
Charts and Graphs	—
Drawings	140
Models	—
Specimens	—

The exhibition now comprises :

Posters	15
Photographs	2161
Charts and Graphs	234
Drawings	216
Descriptive notes	1658
Specimens	666

It is a pleasure to report that the following distinguished persons have visited the museum this year :—

Dr. Mohamed Amin El Sayed	..... Minister of Health.
Dr. Osman Khalil Osman	..... Dean Faculty of Law, Ein Shems College, Cairo University.
Mr. Mohed. Fowad Gelal	..... President, Arab Graduates Conference.
Mr. James W. Wright	..... W.H.O. Geneva.
Mr. R. A. E. Gally	..... Colonial Products Laboratory, London.
Mr. Hendrik G. Wolf	..... Inst. of Trop. Medicine, Sydney.
Dr. A. N. Taba	..... Deputy Director, W.H.O. Alexandria.
Sir E. W. Pridie	..... Colonial Office, London

Dr. J. S. Peterson	.....	..... W.H.O. Geneva.
Dr. Hafiz Amin	.....	..... Deputy Under Secretary for Ministry of Health Cairo.
Dr. Lotfi Ahmed	.....	..... Deputy Director Health Administration, Cairo.
Dr. B. Kesic	....	..... School of Public Health, Fagub, Yugoslavia W.H.O.
Dr. Harold R. Shipman		..... W.H.O. Qalyab Project, Egypt.

A Seminar-Group of 16 Members from the World Health Organisation had visited the Museum on November, 1955.

Sections of the Museum are :—

1. Malaria.
2. Trypanosomiasis.
3. Leishmaniasis.
4. Syphilis.
5. Yaws.
6. Relapsing fever
7. Filariasis.
8. Diphtheria.
9. Ancylostomiasis.
10. Schistosomiasis.
11. Madura disease.
12. Nutrition.
13. Tuberculosis.
14. Gonorrhoea.
15. Cholera.
16. Tetanus.
17. Anthrax.
18. Cerebro-Spinal-Meningitis.
19. Plague.
20. Rabies.
21. Leprosy.
22. Measles.
23. Mumps.
24. Yellow Fever.
25. Smallpox.
26. Chickenpox.
27. Vaccinia.
28. Dengue.
29. Typhus.
30. Quarantine Arrangements.
31. Phlebotomus Fever.
32. Disinfection Methods.
33. Meteorology.
34. Water Supply.
35. Influenza.
36. Pneumonia.
37. Dysentry.
38. Enteric Fever.
39. Maternity and Child Welfare.
40. School Medical Service.
41. Town Planning.
42. Housing.
43. Undulent Fever.
44. Eye Disease.
45. Medical Entomology.
46. Skin Disease.
47. Disposal of Waste Matter
48. Folk Medicine.
49. Propaganda.
50. Rural Health.
51. Hydatid Disease.
52. Venomous Snakes.
53. Historical Medicine.
54. Tumours.
55. Black Water Fever.

CHAPTER XII.

METEOROLOGY.

Table XXV shows the mean of the rainfall recorded in provincial meteorological stations :—

TABLE XXV.

Province	No. of Stations	Mean rainfall mms.	Highest Recorded mms.	Lowest Recorded mms.
Bahr El Ghazal	8	1,013	1,277	752
Blue Nile	18	407	831	121
Darfur	6	510	844	187
Equatoria	5	1,320	1,619	1,158
Kassala	15	257	866	26
Khartoum	6	174	197	154
Kordofan	10	456	789	163
Northern	8	15	97	2
Upper Nile	9	865	1,480	496

TABLE 1.

OUT-PATIENTS.

NEW CASES BY DISEASES AND TOTAL ATTENDANCES

DISEASE	B.EL GHAZAL	BLUE NILE	DARFUR	EQUATORIA	KASSALA	KHARTOUM	KORDOFAN	NORTHERN	UPPER NILE	TOTAL	
1. Cholera	—	—	—	—	—	—	—	—	—	—	1
2. Plague	—	—	—	—	—	—	—	—	—	—	2
3. Small Pox ...	81	—	24	430	—	2	670	—	220	1,427	3
4. Typhus	—	—	—	—	—	—	—	—	—	—	4
5. Yellow Fever ...	—	—	—	—	—	—	—	—	—	—	5
6. T.B. Pulmonary	223	1,304	186	150	669	759	369	527	260	4,447	6
7. T.B. Non-Pulmonary ...	29	473	106	39	448	370	172	215	169	2,021	7
8. Pneumonia ...	1,451	15,300	3,398	2,625	3,172	9,735	8,348	5,505	2,881	52,415	8
9. Influenza ...	31	4,283	2,232	913	2,347	11,624	2,877	8,416	118	32,841	9
10. Other Respiratory diseases ...	17,977	316,396	58,502	89,419	113,054	147,289	152,411	126,540	43,792	1,079,451	10
11. Cerebro-spinal Meningitis ...	6,710	122	50	159	254	49	147	20	1,517	9,028	11
12 Chicken Pox ...	126	4,229	581	505	875	1,992	1,501	1,260	1,406	12,475	12
13. Diphtheria ...	1	67	3	2	94	91	52	38	8	356	13
14. Encephalitis Lethargica ...	—	—	—	—	—	4	3	—	—	7	14
15. Measles	40	5,033	420	184	1,176	2,972	655	3,561	1,091	1,091	15
16. Mumps	707	7,969	1,275	137	1,757	3,805	2,021	2,134	585	20,390	16
17. Poliomyelitis, acute	—	3	—	—	—	172	1	—	—	176	17
18. Rheumatism, acute	717	2,648	718	1,530	722	3,571	2,014	784	135	12,839	18
19. Whooping Cough...	5	4,173	345	799	1,783	1,623	2,232	3,825	810	15,595	19
20. Dysentery ...	2,610	18,287	8,048	2,680	5,195	15,046	8,204	13,799	6,601	80,470	20
21. Enteric Fever ...	—	196	3	5	45	52	16	115	17	449	21
22. Gastro-enteritis of Children ...	73	28,001	2,958	139	3,127	23,742	4,807	9,051	2,832	74,730	22
23. Undulant Fever ...	—	37	135	1	4	6	4	1	—	188	23
24. Filariasis	14	5	23	702	5	3	13	1	1	767	24
25. Leishmaniasis ...	1	1,284	15	60	381	14	3	—	131	1,889	25
26. Malaria	10,945	85,771	26,607	37,203	33,933	15,313	100,504	13,651	28,667	352,594	26
27. Blackwater Fever	—	2	3	—	1	1	—	1	2	10	27
28. Onchocerciasis ...	34	—	—	47	—	43	—	—	—	124	28
29. Phlebotomus Fever	—	—	—	—	—	—	—	—	8	8	29
30. Relapsing Fever ...	—	1	—	—	—	—	—	—	—	1	30
31. Trypanosomiasis ...	—	—	—	310	—	—	—	—	—	310	31
32. Ancylostomiasis ...	2,410	83	343	3,658	48	11	1	260	63	6,877	32
33. Dracontiasis ...	1,504	196	13,325	1,327	24	38	389	—	339	17,142	33
34. Schistosomiasis ...	386	13,346	3,780	1,878	270	1,408	6,778	3,770	125	31,741	34
35. Gonorrhoea ...	2,684	6,252	6,629	4,378	3,703	3,624	6,067	1,042	3,152	37,531	35
36. Soft Sore	12	440	1,046	45	218	550	1,346	29	42	3,728	36
37. Syphilis	5,174	17,215	31,660	3,841	7,170	8,165	22,545	3,976	13,515	113,231	37
38. Yaws	8,508	—	—	13,770	—	—	—	—	11,209	33,487	38
39. Anthrax	—	—	1	—	90	1	—	—	—	92	39
40. Hydrophobia, Human	2	6	—	—	3	1	5	1	1	19	40
41. Leprosy	442	112	91	463	8	49	18	29	36	1,248	41
42. Madura	—	274	21	—	57	922	35	15	2	1,326	42
43. Tetanus											
44. Heat Stroke Syndrome ...	30	81	10	22	16	14	22	11	6	212	43
45. Confinements ...	—	17	18	2	15	—	2	—	—	54	44
46. Gynaecological ...	282	645	264	259	285	2,455	606	379	101	5,276	45
47. Diseases of Pregnancy and Parturition ...	162	12,080	2,549	137	4,276	10,879	7,431	1,455	92	39,061	46
48. Puerperal Fever ...	5	1,225	462	110	—	3,769	3,739	257	10	9,577	47
49. Wounds and Injuries ...	1	78	24	3	30	58	171	35	25	425	48
50. Tropical Ulcer ...	43,404	279,761	110,547	125,129	79,224	136,628	155,070	114,401	69,704	1,113,868	49
51. Diabetes	6,750	1,572	4,032	13,422	529	98	11,236	3	3,328	40,970	50
52. Pellagra	2	208	74	2	569	1,255	200	348	5	2,663	51
53. Scurvy	2	1	1	3	---	—	—	18	430	455	52
54. Neoplasms, Malignant ...	—	264	41	2	380	34	254	8	11	994	53
55. Neoplasms, non-malignant ...	9	72	445	16	901	101	173	107	26	1,850	54
56. Trachoma ...	170	5,993	1,981	26	495	487	1,311	663	172	11,298	55
57. All other eye diseases ...	116	38,543	7,640	1,125	6,245	43,484	6,899	59,208	3,699	166,959	56
58. Ear Diseases ...	15,290	261,665	49,256	45,100	106,195	164,347	95,159	116,083	49,738	902,833	57
59. Skin Diseases ...	6,793	56,023	13,888	8,105	18,732	21,232	19,764	30,235	10,249	185,021	58
60. Alimentary Diseases	13,468	35,579	23,453	30,373	9,354	14,294	27,634	16,247	12,278	182,680	59
61. Circulatory Diseases ...	25,679	392,903	95,028	73,891	125.657	164,513	175,370	160,858	42,360	1,256,259	60
62. Genito-Urinary Diseases ...	339	11,915	8,160	193	16,920	15,370	11,928	17,583	516	82,924	61
63. Organic Nervous Diseases ...	570	41,017	17,976	1,138	11,156	16,929	17,894	28,558	1,722	136,960	62
64. Functional Nervous Diseases ...	11	4,556	247	8	584	614	3,421	5,733	295	15,469	63
65. Fever of uncertain origin	164	1,084	5,850	29	—	762	1	400	—	8,290	64
66. All other conditions	16,982	30,665	15,260	27,537	47,141	73,661	18,925	23,900	40,218	294,289	65
67. Poisoning	34,860	264,871	49,304	81,842	150,331	115,602	80,471	73,571	46,115	896,967	66
68. Hydated Cysts ...	—	197	53	—	234	251	71	586	—	1,392	67
69.	—	—	—	27	—	—	—	—	—	27	68
70.	—	—	—	—	—	—	—	—	—	—	69
	—	—	—	—	—	—	—	—	—	—	70
Total New Cases	227,986	1,974,523	569,091	575,900	759,902	1,039,884	961,954	849,196	400,858	7,359,294	
ATTENDANCES :											
MEN	359,790	1,471,029	515,225	444,530	505,547	805,106	714,373	597,042	314,070	5,726,712	
WOMEN	223,928	1,125,155	388,350	235,259	385,013	873,317	580,594	642,053	202,716	4,656,385	
CHILDREN ...	668,934	1,817,160	492,426	312,466	563,829	887,425	930,287	1,073,963	218,981	6,965,471	
Total Attendances ...	1,252,652	4,413,344	1,396,001	992,255	1,454,389	2,565,848	2,225,254	2,313,058	735,767	17,348,568	
MISSIONS	—	—	—	141,829	—	48,856	96,806	—	58,491	345,982	
Grand Total	1,252,652	4,413,344	1,396,001	1,134,084	1,454,389	2,614,704	2,322,060	2,313,058	794,258	17,694,550	

TABLE II.

ADMISSIONS AND DEATHS BY DISEASES.

DISEASE	BAHR-EL-GHAZAL		BLUE NILE		DARFUR		EQUATORIA		KASSALA		KHARTOUM		KORDOFAN		NORTHERN		UPPER NILE		TOTAL		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	
1. Cholera	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
2. Plague	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
3. Small Pox	81	12	—	—	24	2	424	38	—	—	2	1	670	216	—	—	220	15	1,421	284	3
4. Typhus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4
5. Yellow Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5
6. T.B. Pulmonary	177	15	678	24	113	14	129	8	562	31	404	27	267	30	263	9	104	19	2,697	177	6
7. T.B. Non-Pulmonary	29	1	138	9	81	5	28	1	164	9	113	8	89	8	95	5	86	11	823	57	7
8. Pneumonia	476	19	1,611	84	726	48	1,055	63	824	36	1,238	43	1,639	61	803	49	419	13	8,791	317	8
9. Influenza	2	1	13	—	128	4	45	—	9	—	132	—	59	—	145	—	35	—	568	5	9
10. Other Respiratory Diseases	591	17	1,427	21	920	19	825	8	1,149	24	453	4	1,196	32	911	6	418	6	7,800	137	10
11. Cerebro-spinal Meningitis	6,589	567	108	22	50	8	61	18	33	17	33	8	125	37	15	7	1,517	144	8,531	828	11
12. Chicken Pox	55	—	263	1	543	1	167	—	288	—	121	—	524	—	73	—	500	—	2,534	2	12
13. Diphtheria	1	1	64	8	3	1	2	1	64	11	96	3	50	5	38	6	8	2	326	38	13
14. Encephalitis Lethargica	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	1	—	14
15. Measles	10	2	123	—	130	1	16	—	88	—	73	—	130	—	142	—	163	—	875	3	15
16. Mumps	76	—	246	1	285	—	20	—	106	—	25	—	186	2	48	1	74	—	1,066	4	16
17. Poliomyelitis, Acute	—	—	3	—	—	—	—	—	—	—	1	—	1	—	—	—	—	—	5	—	17
18. Rheumatism, Acute	114	4	232	1	44	—	49	1	111	—	108	—	89	2	108	2	71	—	926	10	18
19. Whooping Cough	1	—	117	3	33	—	103	8	13	—	35	—	51	5	37	3	37	1	427	20	19
20. Dysentery	365	7	474	125	495	14	463	7	457	3	339	6	358	25	319	1	528	29	3,798	217	20
21. Enteric Fever	—	—	196	11	3	—	5	1	21	1	49	1	16	—	110	6	16	3	416	23	21
22. Gastro-Enteritis of Children	5	1	360	44	168	10	136	3	478	58	250	37	188	19	342	54	204	8	2,131	234	22
23. Undulant Fever	—	—	36	1	—	—	1	—	3	—	4	—	4	—	1	—	—	—	49	1	23
24. Filariasis	8	—	4	—	1	—	51	1	1	—	1	—	13	—	—	—	—	—	79	1	24
25. Leishmaniasis	1	—	655	43	9	1	60	1	369	53	11	1	1	—	—	—	78	9	1,184	108	25
26. Malaria	1,177	19	2,496	59	597	24	2,813	93	1,445	23	286	2	3,010	36	340	4	575	18	12,739	278	26
27. Blackwater Fever	—	—	2	1	—	—	—	—	1	—	1	1	—	—	1	1	—	—	5	3	27
28. Onchocerciasis	34	—	—	—	—	—	9	—	—	—	30	3	—	—	—	—	—	—	73	3	28
29. Phlebotomus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	29
30. Relapsing Fever	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	30
31. Trypanosomiasis	—	—	—	—	—	—	310	2	—	—	—	—	—	—	—	—	—	—	310	2	31
32. Ancylostomiasis	365	6	4	—	47	—	869	4	14	—	2	—	—	—	25	—	3	—	1,329	10	32
33. Dracontiasis	97	—	9	—	2	—	121	—	17	—	22	1	69	—	—	—	31	—	368	1	33
34. Schistosomiasis	75	1	143	6	39	1	376	3	22	—	182	1	36	1	82	1	17	1	972	15	34
35. Gonorrhoea	434	3	303	15	116	1	898	1	99	—	11	—	310	3	33	—	120	—	2,324	23	35
36. Soft Sore	2	—	70	—	22	—	5	—	8	—	2	—	7	—	13	—	11	—	140	—	36
37. Syphilis	731	12	40	—	929	8	1,213	—	110	3	32	—	552	17	91	—	667	1	4,365	41	37
38. Yaws	330	2	100	2	—	—	519	1	—	—	—	—	—	—	—	—	596	—	1,545	5	38
39. Anthrax	—	—	—	—	1	—	—	—	86	1	—	—	—	—	—	—	—	—	87	1	39
40. Hydrophobia, Human	2	2	6	6	—	—	—	—	3	3	1	1	5	5	—	—	1	1	18	18	40
41. Leprosy	29	—	6	—	11	—	3	2	6	—	31	1	7	—	3	—	6	1	102	4	41
42. Madura Diseases	—	—	84	—	10	—	—	—	49	—	64	—	34	—	15	—	—	—	256	—	42
43. Tetanus	28	13	74	22	10	2	20	10	8	3	12	2	22	9	11	3	6	3	191	67	43
44. Heat Stroke Syndrome	—	—	17	4	1	—	—	—	15	—	—	—	1	—	—	—	—	—	34	4	44
45. Confinements	282	3	584	17	102	2	261	4	283	2	428	1	339	16	232	15	96	2	2,607	62	45
46. Gynaecological	122	—	2,058	12	314	3	90	2	706	6	895	3	738	12	475	7	47	—	5,445	45	46
47. Diseases of Pregnancy and Parturition	4	1	294	2	74	3	101	—	—	—	834	4	—	—	45	—	9	—	1,361	10	47
48. Puerperal Fever	1	1	38	—	20	1	3	—	29	—	51	1	—	—	22	1	4	—	168	4	48
49. Wounds and Injuries	1,943	30	4,173	71	2,738	53	3,688	65	2,829	62	2,319	20	4,252	52	1,456	20	1,678	19	25,076	392	49
50. Tropical Ulcer	372	5	37	—	256	3	678	1	23	—	11	—	468	—	—	—	472	—	2,317	9	50
51. Diabetes	1	—	70	7	9	1	2	—	101	3	201	9	29	1	78	12	3	1	494	34	51
52. Pellagra	2	—	1	—	1	—	2	—	—	—	—	—	—	—	3	—	13	—	22	—	52
53. Scurvy	—	—	5	1	8	—	—	—	17	—	2	—	8	—	1	—	1	—	42	1	53
54. Neoplasms, Malignant	7	—	36	2	29	6	19	3	101	4	83	14	173	8	35	6	21	—	504	43	54
55. Neoplasms, non Malignant	69	—	37	2	91	—	17	—	57	2	126	—	56	—	30	—	7	—	490	4	55
56. Trachoma	3	—	26	—	34	—	14	—	148	—	2	—	16	—	53	—	67	—	363	—	56
57. All Other eye diseases	289	—	389	1	148	1	536	—	224	—	917	1	341	—	593	—	376	—	3,813	3	57
58. Ear Diseases	126	—	52	1	26	—	128	—	28	—	22	1	71	1	43	—	39	—	535	3	58
59. Skin Diseases	347	—	213	6	86	—	730	—	55	—	63	—	209	3	122	—	126	5	1,951	14	59
60. Alimentary Diseases	592	30	2,107	122	1,064	66	992	27	1,527	59	2,039	19	1,495	42	1,268	46	389	10	11,473	421	60
61. Circulatory Diseases	21	6	588	66	219	16	63	8	1,380	47	560	20	318	30	640	46	72	6	3,861	245	61
62. Genito-Urinary Diseases	38	1	789	44	423	15	32	5	465	20	460	17	544	26	649	7	61	2	3,461	137	62
63. Organic Nervous Diseases	3	—	99	7	40	—	21	1	104	1	113	10	122	13	92	2	6	1	600	35	63
64. Functional Nervous Diseases	32	1	53	7	127	—	9	—	—	—	22	1	1	—	22	1	—	—	266	10	64
65. Fever of uncertain origin	228	12	385	33	360	15	752	13	791	51	340	17	147	26	746	19	208	7	3,957	193	65
66. All Other conditions	3,682	191	1,747	42	703	26	999	14	1,988	42	770	30	900	20	320	3	2,041	25	13,150	393	66
67. Poisoning	—	—	59	2	26	1	—	—	41	2	8	—	24	2	23	3	—	—	181	10	67
68. Hydated Cysts	—	—	—	—	—	—	27	—	—	—	—	—	—	—	—	—	—	—	27	—	68
TOTAL	19,959	986	23,943	858	12,439	376	19,960	418	17,520	578	14,431	319	19,960	765	11,012	346	12,247	363	151,471	5,009	
MISSIONS	—	—	—	—	—	—	1,343	20	—	—	1,021	95	1,068	131	—	—	—	—	3,432	246	
GRAND TOTAL	19,959	986	23,943	858	12,439	376	21,303	438	17,520	578	15,452	414	21,028	896	11,012	346	12,247	363	154,903	5,255	